2010 Water Quality and Wild Rice Monitoring Report

Prepared for Essar Steel Minnesota LLC

September 2010 Version 1





2010 Water Quality and Wild Rice Monitoring September 2010

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1.0 Background

On October 11, 2007, Minnesota Steel Industries (Minnesota Steel) received a final air permit and authorization to construct and operate the reactivation of the former Butler Taconite mine and tailings basin area near Nashwauk, Minnesota and build a new processing facility to make sheet steel coils from the ore that is mined. In October 2007 Essar Steel purchased Minnesota Steel and formed Essar Steel Minnesota LLC (Essar). Since the purchase of Minnesota Steel, Essar has proposed modifications to increase its taconite pellet capacity to a nominal 6.5 million metric tons per year over a 15 year mining time period. The proposed modifications are referred to as the Essar Steel Minnesota Modifications Project. This increase in pellet production capacity will require 1) the installation of additional crushing and concentrating equipment, 2) a global standard sized indurating furnace, and 3) an increase in the rate of mining. The Department of Natural Resources (DNR) has concluded the proposed modifications require that a State Supplemental Environmental Impact Statement (Supplemental EIS) be prepared in accordance with Minnesota Rules 4410.3000 subpart 3A.

In the preparation notice for the Supplemental EIS, one of the issues identified for study is wild rice surveying and monitoring. This report has been developed to meet the needs of the SEIS as stated in the preparation notice, as follows:

Wild Rice. Information on the current presence of wild rice in receiving water bodies from the ESML project will be identified and assessed. Changes to sulfate concentrations for affected water bodies will be modeled. This information will be used to identify potential impacts to wild rice in receiving waters due to changes in sulfate concentrations and/or water levels. Potential adverse environmental effects to water bodies will be identified and monitoring and/or mitigation will be developed to detect changes and to avoid and/or minimize impacts.

This report contains the following information.

- 1. A summary of available 2009 and 2010 water quality and hydrologic monitoring data collected on Swan Lake;
- 2. Available literature review information to determine whether records of historical wild rice harvesting or cultivation exist, and if so to provide a summary of their contents;

- 3. Initial wild rice survey results to confirm the presence or absence of wild rice in lakes and bays downstream of the Proposed Project;
- 4. Wild rice survey data (stand size, density and plant height) for those water bodies identified to contain wild rice.

2010 water quality and wild rice monitoring results and information presented in this report were collected based on the technical memorandum entitled: "Essar Minnesota SEIS – Wild Rice Surveys and Water Quality Monitoring Protocol", dated April 9, 2010; revised May 25, 2010 (Barr Engineering) (Wild Rice Study Protocol). Also presented in the report is the 2009 Swan Lake water quality monitoring data from the U. S. Steel Keetac Expansion project EIS.

Water bodies downstream of the Essar project include Swan Lake, Ox Hide Lake, O'Brien Lake, Snowball Lake, and Pickerel Creek (see Figure 1). No wild rice was found in Ox Hide Lake, O'Brien Lake, Snowball Lake, and Pickerel Creek (see Section 3.1 for additional details). In addition to the initial survey results, none of the historical records indicated the presence of wild rice on these water bodies. Per the approved protocol, water quality sampling was ceased and no wild rice counts were conducted on these water bodies following the initial wild rice survey. Water quality data and wild rice survey data for Swan Lake were collected. This report provides water quality data collected through August 11, 2010, as well as wild rice data collected in July and August. Water quality sampling will continue through 2010 until ice forms on Swan Lake. An updated report will be submitted following the completion of laboratory analyses of the last samples collected.

2.0 Water Quality Monitoring

Water quality and hydrologic monitoring are currently ongoing for 2010. Results of measurements collected through August 11, 2010 are presented in this report. A final water quality monitoring report will be generated after 2010 water quality monitoring activities are completed. The purpose of water quality monitoring is to evaluate the concentration of sulfate and corresponding basic water quality parameters (e.g., pH) in Swan Lake. Water quality monitoring activities for 2010 are scheduled to continue until ice formation on Swan Lake occurs (typically November or December). Water quality and hydrologic monitoring data were also collected biweekly by Essar on Ox Hide Lake, O'Brien Lake, Snowball Lake, and Pickerel Creek from June 24, 2010 through July 21, 2010. Essar ceased collecting this data following the completion of an initial wild rice survey on these water bodies which confirmed the absence of wild rice (see Section 3.1).

2.1 Water Quality Monitoring Locations

The water quality monitoring locations are identified in Figure 1. Ox Hide Lake (via Ox Hide Creek), Pickerel Creek, and O'Brien Lake (via O'Brien Creek) discharge into the main body of Swan Lake. Snowball Lake (via Snowball Creek) discharges to the Swan River immediately downstream of where Swan Lake discharges to the Swan River west of monitoring location KSW6. Monitoring location KSW7 is located in a shallow (approximately 2- to 3-feet deep) unnamed bay at the southwest corner of Swan Lake near the outlet to the Swan River. The bay, further referred to in this report as Swan Lake Southwest Bay, is attached to the main body of Swan Lake by a small channel. There are no other substantial inlets or outlets to Swan Lake Southwest Bay.

2.2 Water Quality Monitoring Methodology

Water quality monitoring on Swan Lake was conducted by Barr Engineering on behalf of Essar in 2010. Water samples were collected from water surface at all locations on Swan Lake, and at 4-meter depth intervals at KSW5. Water quality monitoring on Ox Hide Lake, Snowball Lake, O'Brien Lake, and Pickerel Creek was conducted by Braun Intertec on behalf of Essar. Water samples were placed on ice and shipped to Braun Intertec's laboratory in Minneapolis for analyses of sulfate, iron, calcium, and magnesium. Water quality analyses consisted of unfiltered sulfate analysis by ion chromatography method (EPA 9056) and unfiltered total iron, total calcium, and total magnesium analysis (EPA 6010B). Temperature, pH, dissolved oxygen, and ORP were measured with a field probe (YSI® model 556 multiprobe or equivalent). Field parameters were collected at 2-meter intervals in Swan Lake at location KSW5.

2.3 Water Quality Monitoring Results

Results of 2010 sulfate, iron, calcium, and magnesium analyses are summarized in Table 1. Field parameter measurements (temperature, pH, dissolved oxygen, and ORP) are included as Appendix A. In addition to water quality data collected in 2010, 2009 water quality data for Swan Lake are also included (U. S. Steel Corporation Keetac Expansion Project's EIS, 2009 Water Quality, Hydrology, and Wild Rice Monitoring Year End Report. Data tables summarizing water quality from that 2009 report are included as Appendix B.

To date, sulfate concentrations in surface samples collected in 2010 from the main body of Swan Lake (KSW4, KSW5, and KSW6) have ranged from 18 mg/L to 31 mg/L, and concentrations in Swan Lake Southwest Bay (KSW7) have ranged from 4.8 mg/L to 9.9 mg/L. Sulfate concentrations in Swan Lake from 2009 to present are presented in Figure 2. The ion chromatography analytical method has an error range of 20 percent according to the method documentation, as represented by error bars included on Figure 2.

On two separate occasions, laboratory results for a sample collected on Swan Lake came back with unusually high sulfate concentrations that were inconsistent with sulfate concentrations of other Swan Lake samples collected on the same date: sample "KSW5-4m" collected on 6/10/2010 and "KSW6" collected on 6/25/2010. The laboratory re-analyzed the samples in question, along with several other samples from the same sampling events. In both cases, sulfate results on the re-analysis were within expected ranges and more closely matched sulfate concentrations of Swan Lake samples collected on the same date. Results from other samples that were re-analyzed closely matched the results of the initial analyses. The laboratory believes the unusually high sulfate results in the two samples in question were the result of contaminated sample vials used to feed samples into the ion chromatography analytical machine. The laboratory has since added procedures to rinse the sample vials with clean laboratory water before using it for ion chromatography analyses. No unusual sulfate results have occurred since the laboratory adopted the additional procedure. The laboratory delivered revised reports for samples collected on 6/10/2010 and 6/25/2010 that utilize results from the re-analysis of sulfate.

2.4 Historic Sulfate Concentrations for Swan Lake

Swan Lake has been monitored for sulfate concentrations in previous years by Minnesota Steel/Essar Steel in 2005, 2006, and 2007. Appendix C includes a figure of historic sulfate data collected from the surface of Swan Lake from 2005 through 2009.

3.0 Wild Rice Survey

The purpose of the Wild Rice Survey is to determine the presence of wild rice (*Zizania palustris L*, known as *Manoomin* in Ojibwe), an annual grass, on Ox Hide Lake, Snowball Lake, O'Brien Lake, Pickerel Creek, Swan Lake Southwest Bay, and the Swan River, which flows out of Swan Lake just north of its Southwest Bay (Figure 1) (Study Area). Since wild rice populations oscillate over an approximate 4- to 6-year period, the following analyses and ground surveys were performed to determine past and current presence of wild rice.

- 1. Literature search to identify if there were historical records of wild rice on the waterbodies potentially affected by the Essar Project.
- 2. On-the-ground verification of the presence of wild rice and sampling of the density of select wild rice stands.
- 3. Analysis of historic infra-red USGS photographs for the presence of wild rice in water bodies potentially affected by the Essar Project.

3.1 Initial Wild Rice Survey

An initial wild rice survey was conducted by Barr to determine whether wild rice was present on Ox Hide Lake, Snowball Lake, O'Brien Lake and Pickerel Creek (Figure 3) on the following dates:

O'Brien Lake – July 20, 2010

Ox Hide Lake and Snowball Lake – July 21, 2010

Pickerel Creek – July 21, 2010 and July 30, 2010

Field reconnaissance for the initial survey of O'Brien Lake, Ox Hide Lake and Snowball Lake was conducted on the water surface by boat and on Pickerel Creek by foot. No wild rice was observed on any of these water bodies.

3.2 Wild Rice Survey Methodology

The following section describes the methodologies used in obtaining information and data on wild rice.

3.2.1 Methodology of Literature Search for Wild Rice in Downstream Receiving Waters from the Project

To determine which water bodies downstream of the Essar Project might potentially have wild rice populations, a literature review of historic and cultural information was conducted. Information examined included the 2008 DNR "Natural Wild Rice in Minnesota" Report, U.S. Department of Interior Geological Survey maps (Topo maps), Trygg maps, and the 2010 Wild Rice Management Workgroup "350 Significant Wild Rice Waters in Minnesota." The Trygg maps were developed by J. William Trygg (1966) utilizing data from the original Government Land Surveys along with other historical surveys and sources (http://www.trygglandoffice.com/maps.html). The MNDNR was also contacted by Essar in December, 2009 regarding historical wild rice records. The Wild Rice Management Workgroup is a coalition of federal, state, tribal resource managers and other wild rice stakeholders. The list is periodically updated as was last updated May 4, 2010 (Appendix D).

3.2.2 Methodology of Historic Aerial Photographic Imagery Analysis

Staff from the Sciences and Technologies Branch USGS-BRD-Upper Midwest Environmental Sciences Center in La Crosse, WI analyzed 2004 and 2008 1-meter resolution NAIP (National Agricultural Imagery Program) natural color and color infrared aerial photographic imagery for the presence of wild rice on Swan Lake Southwest Bay and Swan River in 2009. In 2009, wild rice appeared in some of the same locations as those identified in NAIP photographs, but the results were inconsistent with ground surveys and therefore their results inconclusive.

According to USGS staff in follow up phone conversations in 2009, wild rice can be identified with approximately 80 percent certainty under the following conditions: (1) 0.5-meter resolution or better; (2) use of stereo-scope and infra-red photography; (3) density of wild rice approximately 30 percent coverage or greater (density factor 2 through 5); and (4) no more than two species growing next to or mixed in with wild rice. Until this technology improves (includes greater accuracy in identifying wild rice at smaller densities (less than 30 percent)), aerial photographic analysis should not replace ground surveys. As a result, Barr decided not to conduct aerial photographic analysis, but carried out the ground surveys in 2010.

3.2.3 Methodology of Ground Verification and Density/Acreage Calculations

Surveys to estimate wild rice density and crop acreage were carried out the week of August 16, 2010. Qualitative estimates of wild rice coverage were carried out by canoeing along the perimeter of the wild rice beds and recording bed locations using a Trimble® GPS Pathfinder® ProXH™ receiver. Quantitative estimates of wild rice coverage were determined from representative sampling grids 10-

meter x 10-meter size. Four grids were sampled on Swan Lake Southwest Bay in 2009 and again in 2010. A grid will be set up the week of September 7, 2010 on Swan River (Figure 6). As in 2009, a 0.5 m² PVC square was placed on the water surface at each randomly selected plot and the rice stems within the 0.5 m² square were counted. Height above the water surface was measured for five plants within each 0.5 m² plot. Height was measured to the plant's highest point (seed head). Stem count sum, mean, median, and standard deviation were calculated based on the stem count for 20 plots. The total stem count for each grid comprises 10 percent of the grid area. The total area sampled for each grid was 10 m² (20 plots x 0.5 m² each).

3.2.4 Methodology of Plant Sampling

Additional data to determine differences between plant growth and production within the Study Area were collected. Ten wild rice plants were collected from each grid on Swan Lake Southwest Bay and will be collected from the grid on the Swan River. If sparse stands of wild rice were found in sampling locations, then between 5 to 10 plants were collected in the densest locations. Total plant biomass, root biomass, seed biomass, and seed number will be measured. Basic statistical calculations will be carried out (Table 2 – placeholder).

3.3 Wild Rice Survey Results

The following details the results of the wild rice survey and analyses that have been conducted for Swan Lake Southwest Bay and the Swan River up to the dam (Figures 4 - 6).

3.3.1 Results from Literature Review

No evidence from literature cited in 3.1.1 or other literature resulted in identification of wild rice presence on Snowball Lake, Ox Hide Lake, O'Brien Lake or Pickerel Creek. In a December 29, 2009 e-mail from Mr. Rian Reed of the MNDNR, it was stated that he had reviewed historic MNDNR Fisheries Lake Surveys to determine if wild rice (*Zizania aquatica*) occurred in any of the aquatic plant surveys for Snowball and Ox Hide Lakes. Aquatic plant surveys were taken on Snowball Lake (31-108) in August 1977 and on Ox Hide Lake (31-106) on 06/26/1978. No wild rice was noted in any of these surveys.

In addition, no wild rice was subsequently found in the initial survey on those water bodies. As discussed in the 2009 Water Quality, Hydrology, and Wild Rice Monitoring Report for the Keetac Expansion Project, Swan Lake Southwest Bay and Swan River were identified as potential wild rice water bodies.

3.3.2 Results of Ground Verification and Density/Acreage Calculations

Wild rice was identified from ground surveys performed on Swan Lake Southwest Bay and Swan River the week of August 16, 2010 (Figures 4 - 6). The four grids established on Swan Lake Southwest Bay in 2009 were counted the week of August 16, 2010. Swan Lake Southwest Bay had the largest overall acreage of wild rice, while Swan River had less acreage but one very dense stand of wild rice near the dam (Figure 4). A grid was set up on September 10, 2010 in the Swan River (grid 43). Wild rice stands were identified along more than 90 percent of the perimeter of Swan Lake Southwest Bay (Figures 5 and 6). Average plant heights for grids 6 and 7 were 50 and 60 percent taller, respectively, than average plant heights in 2009. Average plant heights for grids 8 and 9, however, were 90 and 82 percent the average height of plants from 2009. Many of the wild rice beds observed in the center of Swan Lake Southwest Bay were populated with between 30 to 75 percent lily pads. Detailed information on results of the on-the-ground wild rice survey is included in Appendix E. Photographs of wild rice taken from Swan Lake Southwest Bay and Swan River are included in Appendix F.

3.3.3 Results of Plant Density and Seed Calculations

[TBA]

3.4 Wild Rice Survey Discussion

Results from the 2010 ground surveys identified the presence of wild rice on Swan Lake Southwest Bay and Swan River. Although wild rice has been documented and several dense stands have been identified for two years on these water bodies, it is difficult to determine the health and history of wild rice in these lakes. Delays in plant nutrient uptake and wild rice tissue chemistry influence wild rice growth and production from year to year (Walker et al., 2006; Walker et al., 2010). Other factors such as water level may also play a role, but no data has been collected over multiple years and published. Other factors such as water level may also play a role, but no data has been collected over multiple years and published.

Grids 6 and 7 had 537 and 524 stems respectively with a mean stem density of 27 and 26 stems/ 0.5 m² respectively. Grids 8 and 9 had 187 and 174 stems with a mean stem density of 9 stems each/ 0.5 m². The mean stem density for all four grids was 18. Grid 43 had 1713 stems with a mean stem density 86 stem/ 0.5 m². Sulfate concentrations measured at KSW7 in Swan Lake Southwest Bay in 2010 have ranged from 4.8 mg/L to 9.9 mg/L. Additional information will be added regarding plant and seed density data. From two year's data examining wild rice density data and water sulfate levels, it is not possible to determine the effects of sulfate on wild rice growth and production.

References

1854 Treaty Authority. 2008. Wild Rice Monitoring and Abundance in the 1854 Ceded Territory (1998 - 2008)

Minnesota Department of Natural Resources. 2008. Natural Wild Rice In Minnesota: A Wild Rice

Study document submitted to the Minnesota Legislature by the Minnesota Department of Natural Resources February 15, 2008

Walker, R.D., Pastor, J., Dewey, B.W. 2006. "Effects of wild rice (*Zizania Palustris L.*) straw on biomass and seed production in northern Minnesota." *Canadian Journal of Botany*, 84, (1): 1019-1024.

Walker, R.D., Pastor, J., Dewey, B.W. 2010. "Litter Quantity and Nitrogen Immobilization Cause Oscillations in Productivity of Wild Rice (*Zizania palustris L.*) in Northern Minnesota." *Ecosystems*, 13: 485-498.

Wild Rice Management Workgroup (coalition of federal, state, tribal resource managers and other wild rice stakeholders). 2010. "350 Significant Wild Rice Waters in Minnesota." (updated on May 4, 2010)

Tables

Table 1: Water Chemistry Results, 2010 Essar Steel Minnesota LLC

						ES O	H WQ1 -	Oxhide L	ake						
			6/24/2010)				7/7/2010					7/21/2010)	
Depth (m)	5.225.5					Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	29	< 0.020	40	22	190	30	0.024	36	20	172	32	< 0.020	36	20	172

						ES SB	WQ1 - S	nowball	Lake						
		(6/24/2010)				7/7/2010					7/21/2010)	
Depth (m)					Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	12	< 0.020	27	10	109	11	0.024	24	9.4	99	16	0.022	26	10	106

						ES OB W	/Q1 - O'B	rien Lake	e North						
		(6/24/2010)				7/7/2010					7/21/2010)	
Depth (m)	Sulfate						Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	12	0.023	35	18	162	11	0.039	33	17	152	15	0.036	34	17	155

						ES OB W	/Q2 - O'B	rien Lake	South						
			6/24/2010)				7/7/2010				,	7/21/2010)	
Depth (m)						Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	6.2	0.023	30	17	145	7.2	0.075	29	16	138	12	0.11	30	16	141

						ES PC W	Q1 - Pick	erel Cree	k North						
			6/24/2010)				7/7/2010				,	7/21/2010)	
Depth (m)	Sulfate						Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	9.6	0.34	39	130	633	5.5	0.39	35	110	540	6.5	0.55	38	120	589

					E	S PC W	Q2 - Pick	erel Cree	k South						
			6/24/2010)				7/7/2010					7/21/2010)	
Depth (m)	Sulfate						Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	14	2.5	51	100	539	7.5	1.4	48	94	507	15	1.2	63	82	495

<u>Notes</u>

Sulfate Concentration of sulfate in mg/L.

Fe Total iron concentration, in mg/L.

Ca Total calcium concentration, in mg/L.

Mg Total magnesium concentration, in mg/L.

Tot. Har. Total hardness, in mg/L CaCO3.

NA Not Analyzed

24 * Concentration is a result of re-analysis afterinitial result was determined to be an error. Prior result was 39 mg/L sulfate.

21 ** Concentration is a result of re-analysis afterinitial result was determined to be an error. Prbr result was 86 mg/L sulfate.

Table 1: Water Chemistry Results, 2010 Essar Steel Minnesota LLC

						KSW4 -	Swan La	ake, Sout	heast						
			5/1/2010					5/13/2010)				5/27/2010)	
Depth (m)	Sulfate						Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	28	< 0.020	33	21	169	24	0.025	32	20	162	24	< 0.020	32	20	162

						KSW!	5 - Swan	Lake, Ce	nter						
			5/1/2010					5/13/2010)				5/27/2010)	
Depth (m)	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	29	< 0.020	33	22	173	23	0.020	32	20	162	27	< 0.020	31	20	160
4	31	31 < 0.020 NA NA NA					< 0.020	NA	NA	NA	23	< 0.020	NA	NA	NA
8	NA	NA	NA	NA	NA	22	< 0.020	NA	NA	NA	23	< 0.020	NA	NA	NA
12	NA	NA	NA	NA	NA	24	< 0.020	NA	NA	NA	24	< 0.020	NA	NA	NA
16	NA	NA	NA	NA	NA	24	0.024	NA	NA	NA	24	< 0.020	NA	NA	NA
18	NA	NA	NA	NA	NA	23	< 0.020	NA	NA	NA	23	< 0.020	NA	NA	NA

						KSW	6 - Swan	Lake, W	est						
			5/1/2010					5/13/2010)				5/27/2010)	
Depth (m)						Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	29	0.032	31	20	160	23	0.024	30	19	153	23	0.026	30	19	153

						KSW7 -	Swan La	ke, Sout	hwest						
			5/1/2010	·				5/13/2010)				5/27/2010)	
Depth (m)	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	7.7	0.082	20	8.6	85	9.8	0.071	20	8.7	86	9.9	0.088	21	9.6	92

<u>Notes</u>

Sulfate Concentration of sulfate in mg/L.

Fe Total iron concentration, in mg/L.

Ca Total calcium concentration, in mg/L.

Mg Total magnesium concentration, in mg/L.

Tot. Har. Total hardness, in mg/L CaCO3.

NA Not Analyzed

24 * Concentration is a result of re-analysis afterinitial result was determined to be an error. Prior result was 39 mg/L sulfate.

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Table 1: Water Chemistry Results, 2010 Essar Steel Minnesota LLC

	KSW4 - Swan Lake, Southeast														
			6/10/2010)		6/25/2010 7/12				7/12/2010)				
Depth (m)	n) Sulfate Fe Ca Mg Tot. H				Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	0 22 < 0.020 33 22 173 22 0.032 30 20 157 25 0.044 31 20 160														

	KSW5 - Swan Lake, Center														
		(6/10/2010)			(6/25/2010)				7/12/2010)	
Depth (m)	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	21	< 0.020	32	21	166	22	0.022	32	21	166	25	0.023	32	21	166
4	24 *	< 0.020	NA	NA	NA	22	< 0.020	NA	NA	NA	25	< 0.020	NA	NA	NA
8	23	< 0.020	NA	NA	NA	23	< 0.020	NA	NA	NA	25	< 0.020	NA	NA	NA
12	23	0.024	NA	NA	NA	24	< 0.020	NA	NA	NA	26	< 0.020	NA	NA	NA
16	23	< 0.020	NA	NA	NA	23	< 0.020	NA	NA	NA	26	< 0.020	NA	NA	NA
18	22	< 0.020	NA	NA	NA	24	< 0.020	NA	NA	NA	25	0.024	NA	NA	NA

	KSW6 - Swan Lake, West														
	6/10/2010 6/25/2010 7/12/2010														
Depth (m)	n) Sulfate Fe Ca Mg Tot. F					Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Sulfate Fe Ca Mg Tot. F			
0	0 22 0.023 32 21 166 21 ** 0.048 30 21 161 25 < 0.020 32 21 166														

	KSW7 - Swan Lake, Southwest														
	6/10/2010					6/25/2010				7/12/2010					
Depth (m)	Sulfate Fe Ca Mg Tot. H				Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.
0	0 8.3 0.110 21 11 98 6.0 0.062 18 9.1 82 6.2 0.086 20 9.3 88														

<u>Notes</u>

Sulfate Concentration of sulfate in mg/L.

Fe Total iron concentration, in mg/L.

Ca Total calcium concentration, in mg/L.

Mg Total magnesium concentration, in mg/L.

Tot. Har. Total hardness, in mg/L CaCO3.

NA Not Analyzed

24 * Concentration is a result of re-analysis afterinitial result was determined to be an error. Prior result was 39 mg/L sulfate.

21 ** Concentration is a result of re-analysis afterinitial result was determined to be an error. Pror result was 86 mg/L sulfate.

Table 1: Water Chemistry Results, 2010 Essar Steel Minnesota LLC

	KSW4 - Swan Lake, Southeast											
	7/26/2010 8/11/2010											
Depth (m)	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.		
0	26 0.047 30 20 157 20 0.029 30 21 1											

	KSW5 - Swan Lake, Center											
		,	7/26/2010)			-	8/11/2010)			
Depth (m)	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.		
0	25	< 0.020	29	19	151	20	< 0.020	30	21	161		
4	26	0.026	NA	NA	NA	20	< 0.020	NA	NA	NA		
8	25	< 0.020	NA	NA	NA	20	< 0.020	NA	NA	NA		
12	26	< 0.020	NA	NA	NA	21	< 0.020	NA	NA	NA		
16	25	0.050	NA	NA	NA	20	< 0.020	NA	NA	NA		
18	27	< 0.020	NA	NA	NA	18	0.021	NA	NA	NA		

	KSW6 - Swan Lake, West											
		,	7/26/2010)		8/11/2010						
Depth (m)	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.		
0	25 0.034 30 20 157 19 < 0.020 29 20									155		

	KSW7 - Swan Lake, Southwest											
		·	7/26/2010)		8/11/2010						
Depth (m)	Sulfate	Fe	Ca	Mg	Tot. Har.	Sulfate	Fe	Ca	Mg	Tot. Har.		
0	5.2	0.073	18	8.5	80	4.8	0.072	19	8.9	84		

<u>Notes</u>

Sulfate Concentration of sulfate in mg/L.

Fe Total iron concentration, in mg/L.

Ca Total calcium concentration, in mg/L.

Mg Total magnesium concentration, in mg/L.

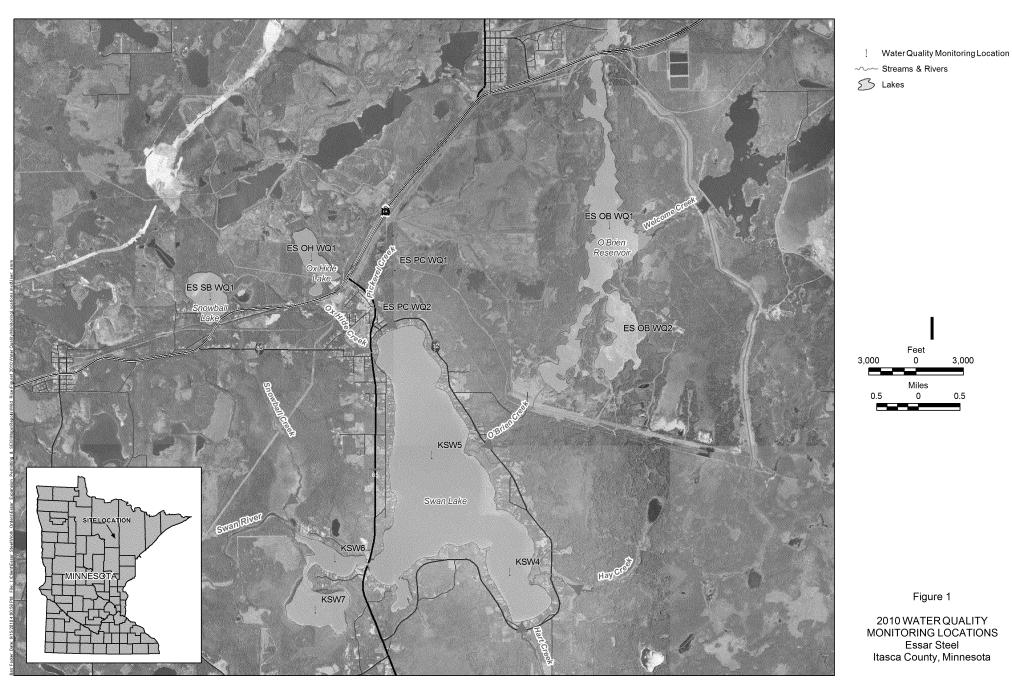
Tot. Har. Total hardness, in mg/L CaCO3.

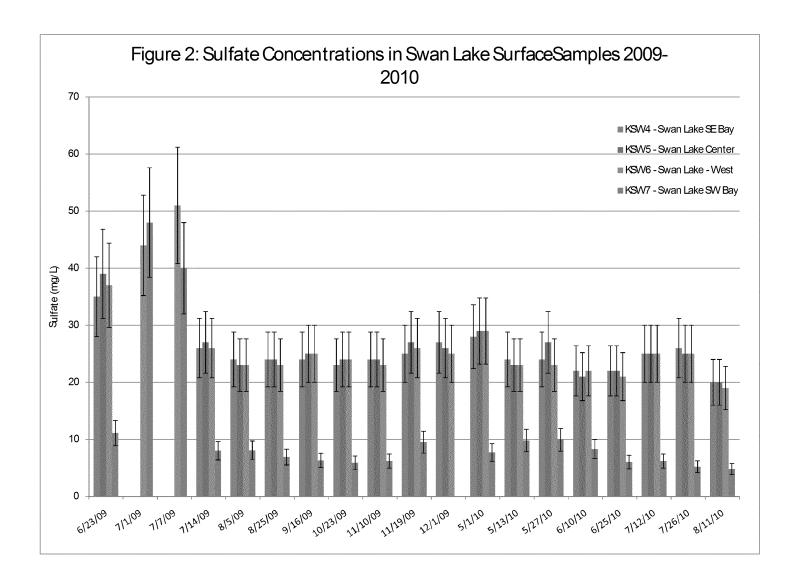
NA Not Analyzed

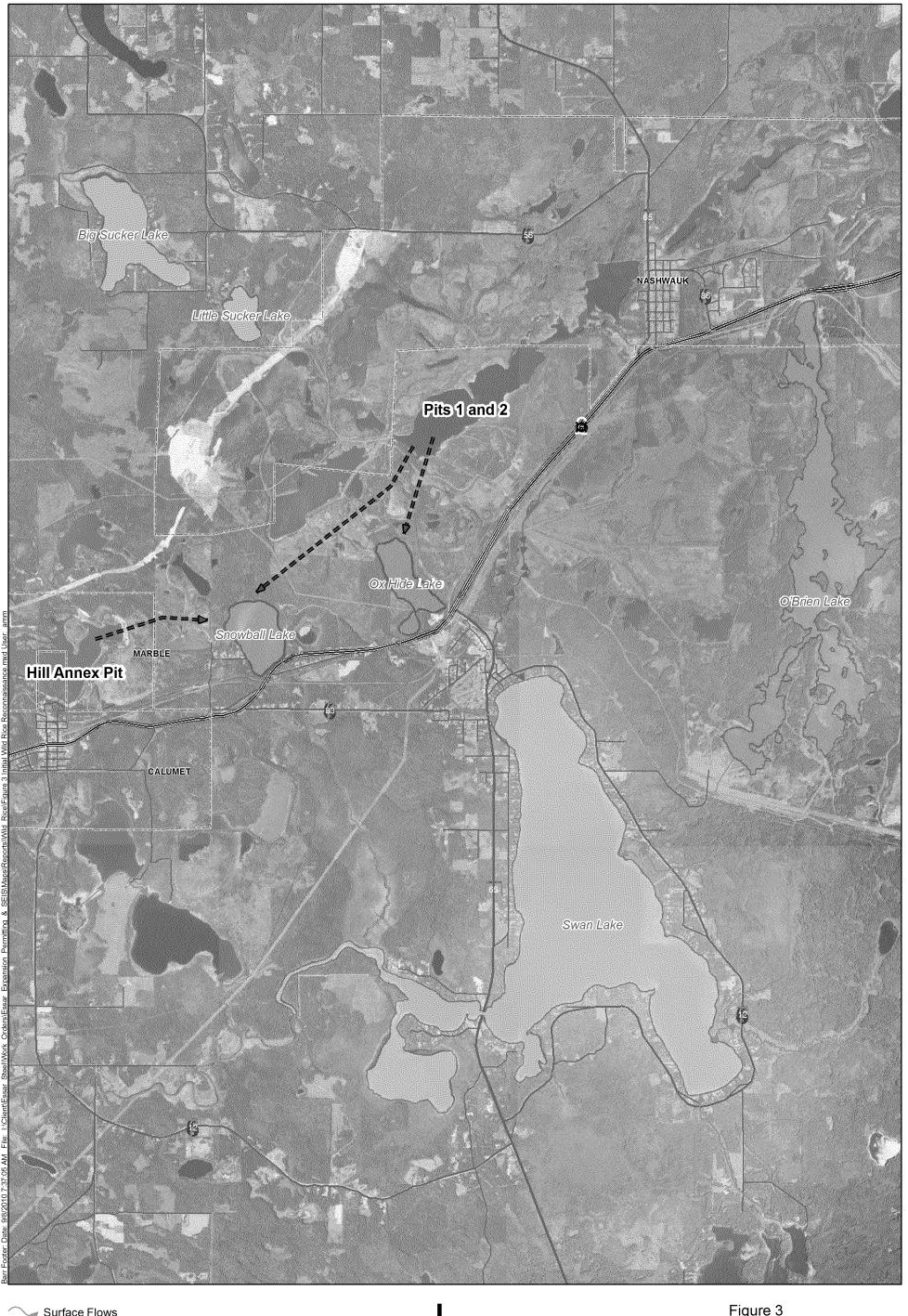
24 * Concentration is a result of re-analysis afterinitial result was determined to be an error. Prior result was 39 mg/L sulfate.

21 ** Concentration is a result of re-analysis afterinitial result was determined to be an error. Pror result was 86 mg/L sulfate.

Figures







Surface Flows
Transfer (Stream Augmentation
if Necessary)
Waterbodies with Initial Observations
to Determine Wild Rice Presence
Streams
Lakes

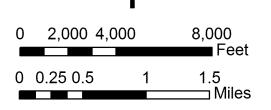


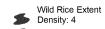
Figure 3
INITIAL WILD RICE RECONNAISSANCE,
O'BRIEN RESERVOIR, SNOWBALL LAKE,
OX HIDE LAKE, AND PICKEREL CREEK
JULY 2010
Essar Steel
Itasca County, Minnesota

R5-2015-0101170000385



Density Rating

- (1: <10% Wild Rice Coverage
- (2: 10-25% Wild Rice Coverage
- 3: 25-50% Wild Rice Coverage
- 4: 50-75% Wild Rice Coverage
- 5: >75% Wild Rice Coverage



Lakes

Streams & Rivers

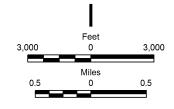
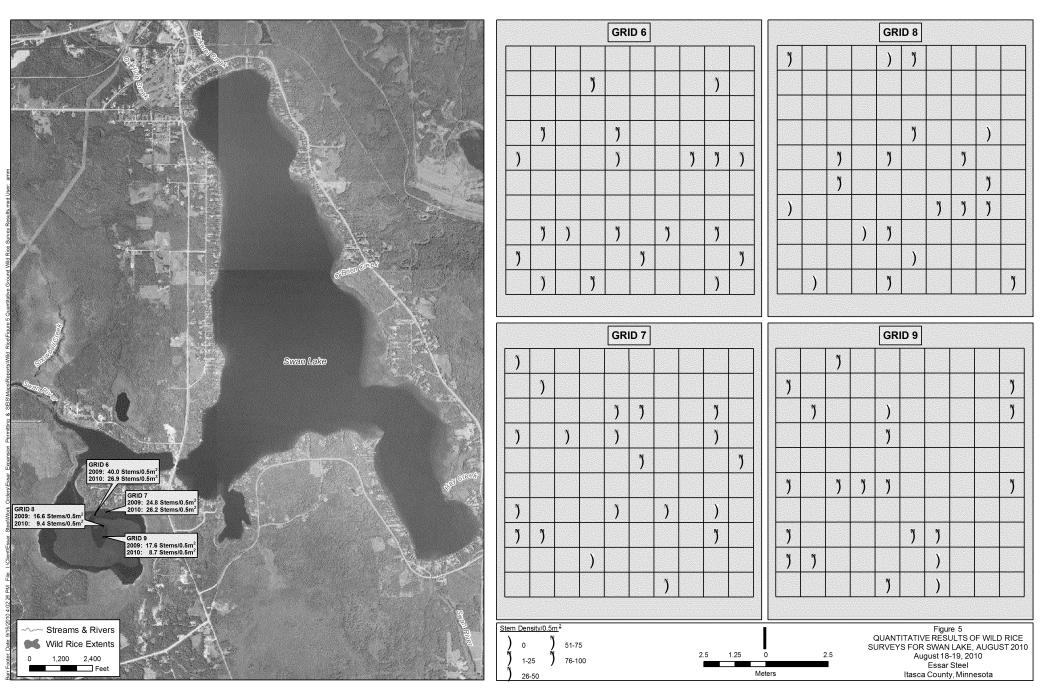


Figure 4

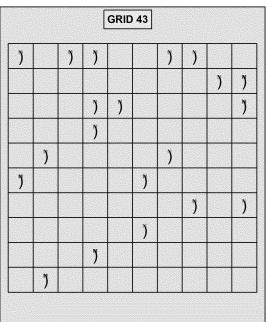
QUALITATIVE RESULTS OF WILD RICE SURVEYS FOR SWAN LAKE AND SWAN RIVER, AUGUST 2010 Essar Steel Itasca County, Minnesota

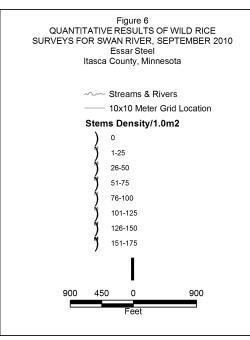
R5-2015-0101170000385



R5-2015-0101170000385







Appendices

Appendix A

Water Quality Monitoring Field Parameters

ES OH WQ1 - Ox Hide Lake

Sample Date	Sample Depth	Temperature	Specific Conductivity	Dissolved Oxygen	рН	ORP
	(m)	(C)	(mS/cm)	(mg/L)		(mV)
6/24/2010	0	20.3	0.365	10.49	8.49	64.6
7/7/2010	0	23.9	0.352	8.94	8.59	2.8
7/21/2010	0	23.3	0.349	8.58	8.55	67.2

<u>Notes</u>

ESSBWQ1 - Snowball Lake

Sample Date	Sample Depth	Temperature	Specific Conductivity	Dissolved Oxygen	рН	ORP
	(m)	(C)	(mS/cm)	(mg/L)		(mV)
6/24/2010	0	20.9	0.242	11.40	8.76	50.2
7/7/2010	0	24.7	0.237	8.33	8.93	-12.3
7/21/2010	0	23.3	0.233	8.41	8.55	57.5

ES OB WQ1 - O'Brien Lake North

Sample Date	Sample Depth	Temperature	Specific Conductivity	Dissolved Oxygen	рН	ORP
	(m)	(C)	(mS/cm)	(mg/L)		(mV)
6/24/2010	0	20.6	0.331	9.80	8.42	81.5
7/7/2010	0	24.0	0.323	8.38	8.55	14.4
7/21/2010	0	23.3	0.321	8.79	8.51	43.5

ES OB WQ2 - O'Brien Lake South

Sample Date	Sample Depth	Temperature	Specific Conductivity	Dissolved Oxygen	рН	ORP
	(m)	(C)	(mS/cm)	(mg/L)		(mV)
6/24/2010	0	21.7	0.280	10.01	8.35	127.1
7/7/2010	0	25.2	0.304	9.80	8.67	16.8
7/21/2010	0	23.2	0.302	7.60	8.30	67.2

ESPCWQ1 - Pickerel Creek North

Sample Date	Sample Depth	Temperature	Specific Conductivity	Dissolved Oxygen	рН	ORP
	(m)	(C)	(mS/cm)	(mg/L)		(mV)
6/24/2010	0	18.1	1.036	9.75	8.17	61.4
7/7/2010	0	21.3	0.914	6.85	8.14	-3.6
7/21/2010	0	19.6	0.723	6.56	8.22	8.2

ESPC WQ2 - Pickerel Creek South

Sample Date Sample Depth		Temperature	Specific Conductivity	Dissolved Oxygen	рН	ORP
	(m)	(C)	(mS/cm)	(mg/L)		(mV)
6/24/2010	0	16.3	0.927	10.74	8.34	66.6
7/7/2010	0	18.5	0.789	8.20	8.14	-10.5
7/21/2010	0	15.4	0.723	7.77	8.05	31.5

KSW4 - Swan Lake (Southeast)

			Specific	Dissolved			
Sample Date	Sample Depth	Secchi Depth	Temperature	Conductivity	Oxygen	рН	ORP
	(m)	(m)	(C)	(mS/cm)	(mg/L)		(mV)
6/24/2009	0	4.0	23.9	0.341	9.45	8.89	-7.8
	1		23.5	0.342	9.91	8.96	-8.6
	2		22.5	0.341	9.78	9.04	-10.8
	3		22.0	0.341	9.96	9.01	-11.4
	4		20.3	0.338	9.79	8.92	-9.5
	5		16.6	0.339	10.75	8.69	-2.7
	6		14.1	0.341	8.66	8.30	6.1
	7		13.5	0.342	8.20	8.21	8.9
	8		13.0	0.342	8.03	8.23	9.1
	8.5		12.9	0.342	7.74	8.19	9.5
7/15/2009	0	4.5	18.9	0.344	8.07	8.31	-14.7
	1		18.9	0.344	8.00	8.32	-12.7
	2		18.8	0.344	7.92	8.31	-9.6
	3		18.8	0.344	7.95	8.29	-6.7
	4		18.7	0.344	7.84	8.25	-3.6
	5		18.6	0.344	7.81	8.21	-1.1
	6		18.6	0.344	7.71	8.19	-0.7
	7		18.4	0.344	7.59	8.17	0.1
	8		18.0	0.345	7.28	8.13	2.8
	8.5		17.3	0.343	6.55	7.92	6.4
8/5/2009	0	2.7	19.4	0.345	9.11	8.91	-26.5
	1		19.4	0.346	8.89	8.84	-19.5
	2		19.4	0.346	9.00	8.79	-15.1
	3		19.3	0.346	8.74	8.76	-12.8
	4		19.2	0.346	8.75	8.74	-9.3
	5		19.2	0.346	8.78	8.73	-7.5
	6		19.1	0.346	8.77	8.63	-5.4
	7		19.0	0.346	8.60	8.62	-2.2
	8		18.8	0.345	8.36	8.54	-0.5
	8.5		18.7	0.345	8.34	8.50	0.2

KSW4 - Swan Lake (Southeast)

	Spe		Specific	Dissolved			
Sample Date	Sample Depth	Secchi Depth	Temperature	Conductivity	Oxygen	рН	ORP
	(m)	(m)	(C)	(mS/cm)	(mg/L)		(mV)
8/25/2009	0	2.9	20.2	0.342	8.05		-101.6
	1		20.1	0.342	8.00		-102.0
	2		20.1	0.343	8.08		-102.1
	3		20.0	0.343	8.06		-101.1
	4		19.9	0.343	8.05		-100.9
	5		19.9	0.344	8.02		-105.5
	6		19.9	0.344	7.98		-100.0
	7		19.7	0.344	7.93		-101.9
	8		19.7	0.344	7.87		-102.8
	8.5		19.6	0.344	7.71		-103.1
0.145.10000	•	0.0	00.5	0.054	0.04	0.00	404.0
9/15/2009		3.6	22.5	0.354	8.34	8.89	-101.6
	1		22.4	0.354	8.76	8.92	-102.0
	2		21.1	0.353	9.22	8.93	-102.1
	3		20.8	0.353	9.00	8.84	-101.1
	4		20.6	0.354	8.42	8.73	-100.9
	5		20.4	0.354	8.42	8.62	-105.5
	6		20.3	0.356	8.29	8.52	-100.0
	7		19.8	0.357	7.77	8.42	-101.9
	8		19.4	0.358	6.16	8.09	-102.8
	8.5		19.1	0.358	5.70	7.93	-103.1
10/23/2009	0	3.5	8.7	0.324	9.54	8.04	-31.2
	1	0.0	8.8	0.324	9.40	8.08	-31.6
	2		8.7	0.324	9.41	8.07	-30.2
	3		8.8	0.324	9.39	8.06	-31.4
	4		8.7	0.324	9.40	8.06	-32.1
	5		8.7	0.324	9.46	8.06	-29.4
	6		8.7	0.324	9.46	8.12	-28.3
	7		8.7	0.325	9.47	8.14	-28.7
	8		8.7	0.325	9.48	8.08	-28.5
	8.5		8.7	0.326	9.48	8.06	-29.4
	3.0				- · · · •		

KSW4 - Swan Lake (Southeast)

			Specific		Dissolved			
Sample Date	Sample Depth	Secchi Depth	Temperature	Conductivity	Oxygen	рН	ORP	
	(m)	(m)	(C)	(mS/cm)	(mg/L)		(mV)	
11/10/2009	0		6.2	0.349	10.02	7.51	124.5	
	1		6.3	0.349	10.06	7.45	123.1	
	2		6.2	0.349	10.08	7.43	119.8	
	3		6.2	0.357	10.09	7.40	119.6	
	4		6.2	0.357	10.04	7.41	115.4	
	5		6.2	0.357	10.08	7.36	114.7	
	6		6.1	0.357	10.02	7.31	114.8	
	7		6.1	0.357	9.92	7.40	110.8	
	8		6.1	0.357	9.97	7.31	109.7	
	8.5		6.0	0.357	9.88	7.31	107.0	
11/19/2009	0		5.3	0.353	10.93	7.66	116.5	
	1		5.3	0.354	11.00	7.88	106.1	
	2		5.2	0.354	10.67	7.99	101.2	
	3		5.1	0.355	10.80	8.03	99.2	
	4		5.1	0.364	10.86	8.05	98.6	
	5		5.1	0.364	11.00	8.06	98.6	
	6		5.1	0.364	10.96	8.01	98.9	
	7		5.0	0.364	11.06	8.10	98.1	
	8		5.0	0.364	10.92	8.16	98.1	
	8.5		5.0	0.364	11.03	8.07	95.7	
12/1/2009	0		3.3	0.339	11.79	8.70	96.0	
	1		3.3	0.339	11.69	8.52	103.9	
	2		3.3	0.339	11.70	8.43	106.8	
	3		3.3	0.339	11.68	8.35	111.5	
	4		3.3	0.339	11.69	8.41	112.9	
	5		3.3	0.339	11.69	8.15	116.4	
	6		3.3	0.339	11.67	8.35	116.8	
	7		3.3	0.339	11.68	8.22	119.6	
	8		3.3	0.339	11.70	8.06	122.0	
	8.5		3.4	0.340	11.62	8.19	121.1	

KSW4 - Swan Lake (Southeast)

	Specific		Dissolved					
Sample Date	Sample Depth	Secchi Depth	Temperature	Conductivity	Oxygen	рН	ORP	
	(m)	(m)	(C)	(mS/cm)	(mg/L)		(mV)	
5/13/2010	0		9.5	0.368	9.95	8.26	192.4	
5/27/2010	0		21.3	0.375	10.37	8.53	16.5	
6/10/2010	0		17.2	0.358	9.30	8.85	5.2	
6/25/2010	0	2.4	21.0	0.355	9.02	8.64	-69.7	
7/12/2010	0	2.9	25.3	0.346	8.06	9.14	-51.5	
7/26/2010	0	2.7	23.8	0.342	8.86	8.83	-48.5	
8/11/2010	0	2.4	24.6	0.340	8.18	8.98	-48.2	

mg/L is milligrams per Liter

□C is degrees Celcius

mS/cm is milliSiemens per centimeter

mV is milliVolts

KSW5 - Swan Lake (Center)

Sample Date	Sample Depth	Secchi Depth	Temperature	Specific Conductivity	Dissolved Oxygen	рН	ORP
·	(m)	(m)	(C)	(mS/cm)	(mg/L)	·	(mV)
6/24/2009		5.0	23.4	0.344	9.47	9.17	-8.0
	1		22.8	0.343	9.37	9.08	-12.7
	2		21.3	0.342	9.79	8.97	-15.1
	3		20.6	0.341	10.17	8.93	-16.7
	4		20.0	0.340	10.12	8.92	-17.8
	5		16.8	0.338	10.65	8.74	-13.3
	6		14.3	0.341	10.05	8.49	-7.2
	7		13.4	0.341	8.80	8.26	-2.1
	8		13.2	0.341	8.93	8.33	-3.1
	9		13.0	0.340	9.27	8.33	-3.5
	10		12.8	0.341	9.05	8.30	-3.5
	11		12.7	0.341	8.52	8.28	-3.2
	12		12.6	0.342	7.40	8.22	-1.2
	13		12.4	0.342	6.81	8.16	-0.1
	14		12.3	0.343	6.34	8.10	1.5
	15		12.2	0.342	6.30	8.10	0.7
	16		11.8	0.344	2.96	7.99	3.4
	17		11.6	0.347	1.20	7.95	3.3
	17.5		11.5	0.348	1.13	7.96	2.4
	18		11.5	0.349	0.90	8.03	-1.6
7/15/2009	0	4.6	19.4	0.344	8.33	8.37	148.2
	1		19.4	0.344	8.35	8.34	141.1
	2		19.4	0.344	8.32	8.32	137.0
	3		19.4	0.344	8.37	8.33	127.1
	4		19.4	0.344	8.39	8.35	120.3
	5		19.4	0.344	8.39	8.30	115.7
	6		19.4	0.344	8.40	8.31	113.2
	7		19.4	0.344	8.32	8.23	107.3
	8		19.1	0.344	8.09	8.22	106.5
	9		18.2	0.345	7.67	8.19	106.2
	10		18.0	0.345	7.61	8.22	104.4
	11		14.7	0.346	4.29	7.51	110.0
	12		13.8	0.345	3.45	7.42	111.9
	13		12.8	0.345	2.31	7.36	111.9
	14		12.1	0.347	0.53	7.26	113.7
	15		12.0	0.348	0.18	7.23	111.8
	16		12.0	0.348	0.15	7.28	110.6
	17		11.9	0.350	0.13	7.39	98.2
	18		11.9	0.351	0.12	7.36	-112.6

KSW5 - Swan Lake (Center)

			_	Specific	Dissolved		
Sample Date	Sample Depth	•	Temperature	Conductivity	Oxygen	рН	ORP
	(m)	(m)	(<u>C</u>)	(mS/cm)	(mg/L)		(mV)
8/5/2009			18.9	0.343	8.69	8.16	28.7
	1		18.9	0.343	8.60	8.14	27.2
	2		18.8	0.344	8.73	8.15	25.5
	3		18.8	0.345	8.69	8.14	24.8
	4		18.8	0.345	8.61	8.16	23.9
	5		18.8	0.345	8.50	8.26	22.5
	6		18.8	0.345	8.62	8.18	22.5
	7		18.8	0.345	8.62	8.20	21.5
	8		18.6	0.346	8.37	8.24	21.2
	9		18.6	0.346	8.32	8.10	23.8
	10		17.8	0.347	6.58	7.85	26.9
	11		16.4	0.347	4.03	7.63	32.3
	12		14.9	0.348	2.07	7.46	35.8
	13		13.5	0.348	0.66	7.36	35.3
	14		12.9	0.350	0.25	7.20	37.1
	15		12.7	0.351	0.16	7.12	39.4
	16		12.5	0.345	0.14	6.98	43.2
	17		12.2	0.357	0.13	6.96	44.4
	18		12.1	0.358	0.13	6.88	47.6
8/25/2009	0	3.1	20.4	0.342	8.22		-111.6
	1		20.3	0.342	8.29		-109.5
	2		20.3	0.342	8.33		-108.8
	3		20.2	0.342	8.29		-109.1
	4		20.1	0.342	8.29		-106.2
	5		19.9	0.342	8.24		-80.4
	6		19.8	0.342	8.00		-83.0
	7		19.8	0.343	7.87		-82.2
	8		19.7	0.343	7.89		-80.3
	9		19.7	0.343	7.84		-84.2
	10		18.7	0.345	6.00		-86.1
	11		18.7	0.346	5.50		-88.5
	12		15.9	0.346	1.06		-92.0
	13		14.2	0.349	0.15		-105.1
	14		13.3	0.353	0.15		-109.2
	15		12.8	0.356	0.14		-122.2
	16		12.7	0.358	0.13		-129.3
	17		12.6	0.359	0.13		-131.2
	18		12.6	0.359	0.12		-141.2

KSW5 - Swan Lake (Center)

				Specific	Dissolved		
Sample Date	Sample Depth	•	Temperature	Conductivity	Oxygen	рН	ORP
	(m)	(m)	(<u>C</u>)	(mS/cm)	(mg/L)		(mV)
9/15/2009		3.8	22.2	0.352	8.20	8.84	80.3
	1		22.2	0.353	9.37	8.85	74.5
	2		22.0	0.352	9.24	8.86	73.1
	3		21.4	0.352	9.18	8.82	74.6
	4		20.7	0.353	9.09	8.64	81.9
	5		20.5	0.354	8.62	8.38	93.6
	6		20.0	0.356	8.02	8.21	98.6
	7		19.7	0.357	7.22	7.96	110.2
	8		19.2	0.357	5.78	7.64	121.3
	9		18.7	0.358	4.76	7.47	124.5
	10		17.8	0.359	2.23	6.93	141.9
	11		17.4	0.359	1.45	6.76	148.9
	12		16.6	0.359	0.16	6.58	155.8
	13		15.5	0.362	0.11	6.50	168.9
	14		14.2	0.367	0.11	6.33	156.9
	15		13.9	0.369	0.11	6.25	148.2
	16		13.0	0.376	0.11	6.35	118.6
	17		12.8	0.379	0.11	6.30	104.0
	18		12.7	0.392	0.11	6.26	91.6
40/00/0000	•	2.4	0.4	0.004	0.00	0.04	40.4
10/23/2009		3.4	9.1	0.324	8.99	8.24	-40.1
	1		9.1	0.324	8.99	8.23	-40.0
	2		9.1	0.324	8.98	8.21	-38.9
	3		9.1	0.324	9.04	8.13	-35.6
	4		9.1	0.324	9.02	8.12	-35.9
	5		9.1	0.324	9.04	8.10	-35.5
	6		9.1	0.324	9.09	8.11	-34.5
	7		9.1	0.324	9.07	8.28	-35.1
	8		9.1	0.324	9.10	8.29	-34.5
	9		9.1	0.324	9.13	8.25	-33.6
	10		9.1	0.324	9.13	8.22	-33.4
	11		9.1	0.324	9.13	8.21	-33.5
	12		9.1	0.324	9.15	7.82	-32.0
	13		9.1	0.324	9.14	7.84	-32.5
	14		9.1	0.324	9.21	7.82	-25.6
	15		9.1	0.324	9.15	7.88	-26.3
	16		8.7	0.324	9.27	7.71	-25.9
	17		8.7	0.324	9.21	7.69	-23.6
	18		8.9	0.331	8.46	7.70	-21.8

KSW5 - Swan Lake (Center)

				Specific	Dissolved		
Sample Date	Sample Depth	•	Temperature	Conductivity	Oxygen	pН	ORP
	(m)	(m)	(<u>C</u>)	(mS/cm)	(mg/L)		(mV)
11/10/2009			6.7	0.356	9.71	7.96	69.9
	1		6.8	0.356	9.79	7.93	70.0
	2		6.7	0.356	9.70	7.99	66.0
	3		6.6	0.356	9.67	7.91	68.5
	4		6.5	0.356	9.64	7.88	71.3
	5		6.5	0.356	9.67	7.85	72.2
	6		6.5	0.356	9.60	7.76	74.7
	7		6.5	0.356	9.64	7.78	76.5
	8		6.4	0.356	9.60	7.74	77.4
	9		6.4	0.356	9.64	7.77	78.1
	10		6.4	0.356	9.59	7.7	78.6
	11		6.4	0.356	9.61	7.63	80.9
	12		6.4	0.356	9.59	7.87	66.4
	13		6.4	0.356	9.60	7.81	67.2
	14		6.4	0.356	9.62	7.8	67.9
	15		6.4	0.356	9.56	7.75	69.5
	16		6.4	0.356	9.60	7.71	70.4
	17		6.4	0.356	9.54	7.71	70.0
	18		6.4	0.356	9.00	7.63	73.0
11/19/2009	0		5.8	0.361	10.53	8.05	144.3
	1		5.8	0.361	10.42	8.03	142.4
	2		5.8	0.361	10.43	7.98	142.1
	3		5.7	0.361	10.46	7.95	141.2
	4		5.7	0.361	10.53	7.89	142.4
	5		5.7	0.361	10.45	7.91	142.1
	6		5.7	0.361	10.43	7.89	140.4
	7		5.7	0.361	10.61	7.91	139.5
	8		5.7	0.361	10.40	7.92	138.0
	9		5.7	0.361	10.58	7.63	139.3
	10		5.7	0.361	10.36	7.81	136.2
	11		5.7	0.361	10.53	7.75	135.4
	12		5.7	0.361	10.55	7.69	135.5
	13		5.7	0.361	10.67	7.69	134.7
	14		5.7	0.361	10.63	7.66	134.3
	15		5.7	0.361	10.46	7.6	134.2
	16		5.7	0.361	10.48	7.65	137.6
	17		5.7	0.361	10.57	7.63	131.9
	18		5.7	0.361	10.61	7.66	132.0

KSW5 - Swan Lake (Center)

Sample Date	Sample Depth	Secchi Depth	Temperature	Specific Conductivity	Dissolved Oxygen	рН	ORP
	(m)	(m)	(□C)	(mS/cm)	(mg/L)		(mV)
12/1/2009	0		4.3	0.336	11.06	8.56	136.7
	1		4.4	0.336	11.18	8.39	140.0
	2		4.3	0.336	11.07	8.3	138.5
	3		4.4	0.336	11.04	8.28	140.0
	4		4.4	0.336	11.11	8.2	141.2
	5		4.4	0.336	11.09	8.18	141.6
	6		4.4	0.336	11.11	8.25	141.9
	7		4.4	0.336	11.09	8.08	144.0
	8		4.4	0.336	11.09	7.95	144.6
	9		4.4	0.336	11.09	8.04	143.3
	10		4.4	0.336	11.09	8.03	142.4
	11		4.4	0.336	11.05	7.98	141.8
	12		4.4	0.336	11.07	8.08	142.0
	13		4.4	0.335	11.10	7.96	141.7
	14		4.3	0.336	11.11	8.14	139.0
	15		4.3	0.336	11.11	8.02	139.7
	16		4.3	0.335	11.11	8.13	139.0
	17		4.3	0.335	11.09	8.03	138.8
	18		4.3	0.335	11.07	8.02	138.3
5/13/2010	0		9.6	0.370	9.87	8.33	188.2
	2		9.6	0.370	9.90	8.32	188.3
	4		9.6	0.370	10.02	8.30	188.8
	6		9.6	0.370	9.93	8.18	189.5
	8		9.6	0.370	9.90	8.20	189.9
	10		9.6	0.370	9.91	8.14	190.3
	12		9.5	0.370	9.90	8.28	190.4
	14		9.5	0.370	9.93	8.22	191.6
	16		9.5	0.370	9.94	8.24	191.8
	18		9.5	0.370	9.81	8.25	192.8

KSW5 - Swan Lake (Center)

				Specific	Dissolved		
Sample Date	Sample Depth	•	Temperature	Conductivity	Oxygen	рН	ORP
-	(m)	(m)	(C)	(mS/cm)	(mg/L)		(mV)
5/13/2010	0		9.6	0.370	9.87	8.33	188.2
	2		9.6	0.370	9.90	8.32	188.3
	4		9.6	0.370	10.02	8.30	188.8
	6		9.6	0.370	9.93	8.18	189.5
	8		9.6	0.370	9.90	8.20	189.9
	10		9.6	0.370	9.91	8.14	190.3
	12		9.5	0.370	9.90	8.28	190.4
	14		9.5	0.370	9.93	8.22	191.6
	16		9.5	0.370	9.94	8.24	191.8
	18		9.5	0.370	9.81	8.25	192.8
5/27/2010	0		18.9	0.374	9.98	8.52	6.6
	2		17.0	0.372	10.58	8.49	8.2
	4		16.2	0.371	10.65	8.54	12.6
	6		14.2	0.371	10.80	8.56	30.9
	8		11.9	0.371	10.67	8.47	37.6
	10		10.8	0.371	10.13	8.35	42.1
	12		10.4	0.372	9.71	8.32	45.3
	14		9.9	0.372	9.14	8.22	-116.8
	16		9.6	0.373	8.82	8.18	-112.7
	18		9.6	0.373	8.52	8.17	-122.7
6/10/2010		2.3	17.4	0.360	9.27	8.70	25.0
	2		17.4	0.359	9.00	8.75	23.6
	4		17.4	0.359	9.27	8.73	22.5
	6		17.4	0.359	9.06	8.73	21.4
	8		13.3	0.362	8.30	8.43	32.3
	10		11.5	0.362	8.24	8.21	39.0
	12		10.5	0.362	7.71	8.07	44.2
	14		10.1	0.362	7.82	8.04	46.7
	16		9.6	0.364	5.35	7.90	49.5
	18		9.6	0.364	5.08	7.81	52.2

KSW5 - Swan Lake (Center)

				Specific	Dissolved		
Sample Date	Sample Depth	Secchi Depth	Temperature	Conductivity	Oxygen	рН	ORP
	(m)	(m)	(<u>C</u>)	(mS/cm)	(mg/L)		(mV)
6/25/2010			21.0	0.361	9.29	8.81	-41.2
	2		19.7	0.361	9.40	8.78	-39.8
	4		19.3	0.361	9.42	8.77	-39.4
	6		18.8	0.364	9.23	8.71	-37.8
	8		15.9	0.369	7.68	8.34	-25.0
	10		12.2	0.371	6.52	8.02	-14.0
	12		11.2	0.371	6.38	7.86	-9.9
	14		10.3	0.372	6.26	7.81	-9.6
	16		9.7	0.373	3.25	7.54	-5.0
	18		9.7	0.373	3.17	7.53	-5.1
7/12/2010	0	5.0	24.9	0.353	8.38	9.08	-41.8
., ,_,_,	2		23.4	0.352	8.39	9.07	-41.1
	4		23.1	0.352	8.28	9.06	-41.0
	6		22.3	0.354	7.44	8.94	-36.4
	8		19.4	0.359	5.17	8.58	-19.2
	10		14.3	0.364	3.84	8.25	-6.6
	12		11.8	0.364	3.57	8.17	-3.1
	14		10.6	0.364	3.13	8.04	1.2
	16		10.0	0.365	0.40	7.96	2.9
	18		9.9	0.369	0.28	8.37	-37.5
8/11/2010	0	3.5	25.6	0.341	8.78	9.02	-53.0
0/11/2010	2	3.5	25.5	0.341	8.80	9.02	-53.0 -53.2
	4		23.5	0.341	8.22	9.0 4 8.96	-50.0
	6		23.0	0.344	7.07	8.90 8.84	-30.0 -45.6
	8		22.0	0.348	7.07 5.04	8.61	-36.9
	10		21.6	0.349	0.09	8.32	-30.9 -27.2
	12		12.3	0.349	0.80	7.95	-27.2 -11.3
	14		12.3	0.361	0.00	7.95 7.87	-11.3 -8.2
	16		10.7	0.370	0.12	7.85	-0.2 -7.5
			10.2				
	18		10.1	0.373	0.13	8.50	-47.6

<u>Notes</u>

mg/L is milligrams per Liter

□C is degrees Celcius

mS/cm is milliSiemens per centimeter

mV is milliVolts

KSW6 - Swan Lake (West)

				Specific	Dissolved		
Sample Date	Sample Depth	•	Temperature (□ C)	Conductivity (mS/cm)	Oxygen (mg/L)	рН	ORP (m)()
6/24/2009	(m) 0	(m) 4.0	24.5	0.319	(mg/L) 8.93	8.87	(mV) -1.1
0/24/2000	v	4.0	24.0	0.010	0.00	0.07	***
7/1/2009	0	2.6	17.9	0.335	8.79	8.21	1.5
7/6/2009	0	3.7	20.0	0.339	8.55	9.39	-12
7/15/2009	0	3.5	20.1	0.339	7.42	8.27	21.8
8/5/2009	0	3.2	19.5	0.338	9.26	9.18	-7.5
8/25/2009	0	3.2	21.1	0.334	8.59		-90.1
9/16/2009	0	3.1	22.5	0.346	8.86	8.97	49.8
10/23/2009	0	3.5	6.2	0.309	10.69	7.91	10.4
11/10/2009	0		5.5	0.339	11.7	7.64	185.1
11/19/2009	0		4.9	0.354	12.4	8.22	102.7
12/1/2009	0		2.7	0.326	12.98	8.29	88.8
5/13/2010	0		10.4	0.354	10.45	8.54	190.5
5/27/2010	0		21.5	0.356	10.15	8.7	8.8
6/10/2010	0		17.5	0.349	8.99	8.91	-2.8
6/25/2010	0	2.3	21.1	0.344	9.31	8.73	-70.1
7/12/2010	0	2.6	25.4	0.351	8.55	9.23	-53.1
7/26/2010	0	2.3	25.5	0.342	9.62	8.94	-49.4
8/11/2010	0	1.4	25.9	0.329	10.44	9.19	-53.9

Notes

mg/L is milligrams per Liter

mS/cm is milliSiemens per centimeter

mV is milliVolts

[☐]C is degrees Celcius

KSW7 - Swan Lake (Southwest Bay)

			Specific	Dissolved		
Sample Date	Sample Depth	Temperature	Conductivity	Oxygen	рН	ORP
	(m)	(<u>C</u>)	(mS/cm)	(mg/L)		(mV)
6/24/2009	0	27.4	0.189	8.55	8.84	17.8
	8.0	27.4	0.188	7.72	8.85	16.1
7/1/2009	0	15.5	0.185	11.00	7.97	23.2
	8.0	15.5	0.185	10.88	8.01	19.0
7/6/2009	0	24.0	0.189	8.23	8.61	-18.4
	0.7	24.0	0.190	8.21	8.60	-23.1
7/15/2009	0	18.7	0.192	7.99	8.00	4.0
	0.7	18.7	0.193	7.98	8.00	-1.2
8/5/2009	0	19.3	0.188	10.00	9.03	-22.2
	0.7	19.3	0.188	9.82	8.91	-18.3
8/25/2009	0	22.7	0.191	8.15		-106.2
9/15/2009	0	23.4	0.216	7.47	8.73	91.3
10/23/2009	0	3.2	0.201	13.20	7.67	10.0
11/10/2009	0	4.8	0.208	12.38	7.82	203.9
11/19/2009	0	4.3	0.215	13.69	7.07	200.0

KSW7 - Swan Lake (Southwest Bay)

			Specific	Dissolved		
Sample Date	Sample Depth	Temperature	Conductivity	Oxygen	pН	ORP
	(m)	(C)	(mS/cm)	(mg/L)		(mV)
5/13/2010	0	10.5	0.195	10.05	8.35	189.9
5/27/2010	0	25.5	0.213	9.09	8.78	1.0
6/10/2010	0	15.8	0.213	9.07	8.73	-0.2
6/25/2010	0	22.2	0.194	8.14	8.46	-59.1
7/12/2010	0	27.1	0.188	7.49	8.89	-35.2
7/26/2010	0	26.9	0.184	10.33	9.11	-54.6
8/11/2010	0	27.2	0.183	8.36	8.95	-46.7

<u>Notes</u>

mg/L is milligrams per Liter

□C is degrees Celcius

mS/cm is milliSiemens per centimeter

mV is milliVolts

Appendix B

2009 Swan Lake Water Chemistry, U. S. Steel Corporation, KeeTac Expansion Project

U.S. Steel Corporation - KeeTac Expansion Project Table 1: Iron and Sulfate Concentrations in Surface Water Samples, 2009. Concentrations are in mg/L

Concentrat	tions are ir	n mg/L																				
									KS	W1A - Hay (Creek Upstro	eam of Hay	Lake									
	6/23	3/2009	7/1/	/2009	7/6/	2009	7/14	/2009	8/5/	/2009	8/25/	2009	9/16/	/2009	10/23	3/2009	11/10	/2009	11/19	9/2009	12/1	/2009
Depth (m)	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron
0	42	0.780	64	0.530	84	0.440	56	0.490	48	0.410	46	0.350	52	0.410	49	0.280	54	0.150	NS	NS	51	0.300
										KS	W1B - Hay I	_ake										
	6/23	3/2009	7/1/	/2009	7/6/	2009	7/14	/2009	8/5/	/2009	8/25/	2009	9/16/	/2009	10/23	3/2009	11/10	/2009	11/19	9/2009	12/1	/2009
Depth (m)	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron
0	49	0.480	60	0.310	78	0.250	55	0.190	49	0.150	47	0.180	48	0.170	46	0.240	48	0.200	NS	NS	NS	NS
										KSI	W2 - Moose	Lake										
	6/23	3/2009	7/1/	/2009	7/6/	2009	7/14	/2009	8/5/	/2009	8/25/	2009	9/16/	/2009	10/23	3/2009	11/10	/2009	11/19	9/2009	12/1	/2009
Depth (m)	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron
Ö	8.4	0.630	NS	NS	NS	NS	NS	NS	4.9	0.340	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	KSW3 - Hay Creek Outlet to Swan Lake																					
	6/23/2009 7/1/2009 7/6/2009 7/14/2009 8/5/2009 8/25/2009 9/16/2009 10/23/2009 11/10/2009 11/19/2009 12/1/2009																					
Depth (m)	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron
Ó	46	0.650	NS	NS	NS	NS	48	0.590	41	0.320	44	0.250	40	0.300	44	0.260	47	0.190	54	0.290	48	0.290
										LCM/A (I -l	0 41 4										
	KSW4 - Swan Lake, Southeast 6/24/2009 7/1/2009 7/6/2009 7/15/2009 8/5/2009 8/25/2009 9/16/2009 10/23/2009 11/10/2009 11/19/2009 12/1/2009																					
Depth (m)	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron
Deptil (III)	35	0.057	NS	NS	NS	NS	26	< 0.020	24		24	0.019 J	24	< 0.020	23	0.015 J	24	< 0.020	25	< 0.020	27	0.027
2	41	0.038	NS	NS	NS	NS	26	< 0.020	25	0.019 J	24	0.029	25	< 0.020	24	0.012 J	23	< 0.020	28	0.020	27	0.030
4	45	0.045	NS	NS	NS	NS	26	< 0.020	25	0.020	24	0.031	25	< 0.020	25	0.013 J	23	< 0.020	27	< 0.020	28	0.050
6	44	0.022	NS	NS	NS	NS	27	< 0.020	25	0.020	25	0.019 J	26	< 0.020	24	0.012 J	23	0.023	27	0.022	27	0.028
8	39	0.017 J	NS	NS	NS	NS	26	< 0.020	25	0.020	24	0.019 J	25	< 0.020	24	0.030	23	< 0.020	28	0.021	28	0.029
8.5	40	0.016 J	NS	NS	NS	NS	26	< 0.020	25	0.023	24	0.021	25	< 0.020	24	0.014 J	24	< 0.020	27	0.021	27	0.048
										KSW5	- Swan Lake	. Center										
	6/24	1/2009	7/1/	/2009	7/6/	2009	7/15	5/2009	8/5/	/2009	8/25/	2009	9/16/	/2009	10/23	3/2009	11/10	/2009	11/19	9/2009	12/1	/2009
Depth (m)	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron
0	39	0.021	NS	NS	NS	NS	27	0.065	23	0.012 J	24	0.069	25	< 0.020	24	0.013 J	24	< 0.020	27		26	< 0.020
2	40	0.027	NS	NS	NS	NS	27	0.020	24	0.008 J	24	0.026	25	< 0.020	24	0.011 J	23	< 0.020	27		26	0.035
4	41	0.024	NS	NS	NS	NS	26	< 0.020	24	0.010 J	24	0.017 J	25	< 0.020	24	0.016 J	23	< 0.020	26	< 0.020	26	< 0.020
6	42	0.029	NS	NS	NS	NS	27	< 0.020	24	0.018 J	24	0.015 J	25	< 0.020	24	0.010 J	23	< 0.020	27	< 0.020	26	< 0.020
8	46 49	0.025 0.014 J	NS	NS	NS	NS NS	26 26	< 0.020 < 0.020	24 24	0.011 J 0.015 J	24 24	0.021 0.014 J	25 25	< 0.020 < 0.020	24	0.012 J 0.012 J	23 24	< 0.020 < 0.020	27	< 0.020 < 0.020	26 27	0.024 0.025
10	51 51	0.014 J	NS NS	NS NS	NS NS	NS NS	26 26	0.020	24	0.015 J	24	0.014 3	25	< 0.020	24	0.012 J	24	< 0.020	28		27	< 0.025
14	75	0.010 3	NS	NS	NS	NS	26	0.022	23	0.020 0.011 J	23	0.057	23	0.020	24	0.010 J	23	< 0.020	27	0.033	26	< 0.020
16	39	0.029	NS	NS	NS	NS	26	0.022	23	0.022	22	0.050	22	0.038	25	0.016 J	25	< 0.020	28	< 0.020	26	< 0.020
18	39	0.071	NS	NS	NS	NS	25	0.043	22	0.019 J	22	0.047	21	0.034	24	0.067	24	< 0.020	27	< 0.020	26	< 0.020
										1/01//0		187										
- 1	6/24	1/2009	7/1/	/2009	7/6/	2009	7/15	5/2009	8/5	/2009	- Swan Lak	e, West 2009	9/16	/2009	10/23	3/2009	11/10	/2009	11/10	9/2009	12/1	/2009
Depth (m)	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron
0	37	0.034	44	0.035	51	0.025	26	0.050	23		23	0.016 J	25	0.020	24	0.018 J	23	0.023	26		25	0.022
•					•		· · · · ·		· · · · ·				•				•		•			

U.S. Steel Corporation - KeeTac Expansion Project Table 1: Iron and Sulfate Concentrations in Surface Water Samples, 2009. Concentrations are in mg/L

	KSW7 - Swan Lake, Southwest																					
	6/24	/2009	7/1/	/2009	7/6/2009		7/15/2009		8/5/2009		8/25/2009		9/16/2009		10/23/2009		11/10/2009		11/19/2009		12/1	/2009
Depth (m)	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron
0	11.1	0.102	48	0.080	40	0.380	8.0	0.086	8.1	0.065	6.9	0.094	6.3	0.069	5.9	0.044	6.2	0.048	9.5	0.034	NS	NS
0.7	12	0.140	32	0.077	45	0.089	8.0	0.086	8.0	0.068	6.9	0.079	6.2	0.065	5.8	0.039	6.2	0.045	9.0	0.034	NS	NS
			· ·																		· ·	

										KS	N8 - Hart C	Creek										
	6/23	3/2009	7/1	/2009	7/6	/2009	7/14	/2009	8/5	/2009	8/25	5/2009	9/16	/2009	10/2	3/2009	11/1	0/2009	11/19	9/2009	12/1	/2009
Depth (m)	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron
0	2.8	0.820	NS	NS	NS	NS	NS	NS	1.5	3.90	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

										Oxhi	de Creek 8	k Lake										
	6/23	/2009		/2009	7/6	/2009	7/14	/2009	8/5/	/2009	8/25	/2009	9/16	/2009	10/23	3/2009	11/1	0/2009	11/19	9/2009	12/1	/2009
Depth (m)	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron	Sulfate	Iron								
Creek	NS	NS	NS	NS	NS	NS	NS	NS	28	0.150	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lake	NS	NS	NS	NS	NS	NS	NS	NS	29	0.017	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes

Concentrations of Iron and Sulfate are in mg/L.
Sulfate results are for ion chromatography method only.

11.1 Value is an average of six surface samples collected from various locations in Swan Lake Southwest Bay.
J Detected but below the Method Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
NS Not sampled.

U.S. Steel Corporation - KeeTac Expansion Project
Table 2: Calcium and Magnesium Concentrations in Su rface Water Samples, 2009.

	Calcium (mg/L)	Magnesium (mg/L)	Hardness* (mg/L CaCO3)
KSW1A —	(Hig/L)	(Hg/L)	(Hig/L GaGGG)
6/23/2009	27	24	166
7/1/2009	32	33	216
7/6/2009	NA	NA NA	NA NA
7/14/2009	29	33	208
8/5/2009	NA NA	NA	NA NA
8/25/2009	36	32	222
9/16/2009	34	37	237
10/23/2009	36	34	230
11/10/2009	37	38	249
11/19/2009	NS	NS	NS
12/1/2009	40	35	244
KSW1B			
6/23/2009	31	26	184
7/1/2009	31	30	201
7/6/2009	NA	NA	NA
7/14/2009	30	32	207
8/5/2009	NA	NA	NA
8/25/2009	35	33	223
9/16/2009	35	35	232
10/23/2009	37	34	232
11/10/2009	36	34	230
11/19/2009	NS	NS	NS
12/1/2009	NS	NS	NS

U.S. Steel Corporation - KeeTac Expansion Project
Table 2: Calcium and Magnesium Concentrations in Su rface Water Samples, 2009.

	Calcium (mg/L)	Magnesium (mg/L)	Hardness* (mg/L CaCO3)
KSW5			
6/24/2009	31	20	160
7/15/2009	31	20	160
8/5/2009	NA	NA	NA
8/25/2009	31	20	160
9/16/2009	32	21	166
10/23/2009	32	21	166
11/10/2009	32	21	166
11/19/2009	32	21	166
12/1/2009	32	21	166
14014/7			
KSW7	40	0.0	00
6/24/2009	18	9.2	83
7/1/2009	19	9.3	86 NA
7/6/2009	NA 20	NA	NA 01
7/15/2009	20	9.9	91
8/5/2009	NA 20	NA 0.7	NA 00
8/25/2009	20	9.7	90
9/16/2009	22	10	96
10/23/2009	23	11	103
11/10/2009	23	10	99
11/19/2009	22 NG	9.9	96 NC
12/1/2009	NS	NS	NS

<u>Notes</u>

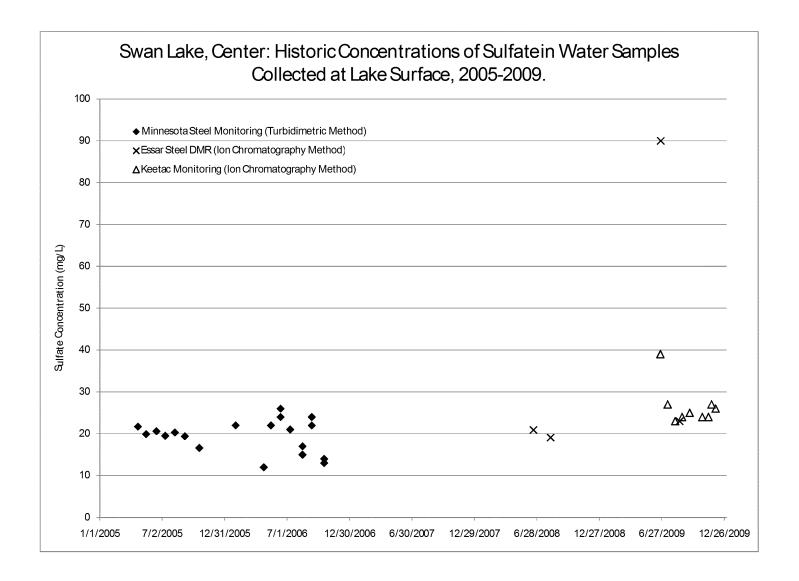
NA Not Analyzed

NS Not Sampled

^{*} Hardness was calculated by summing the concentrations of calcium and magnesium; expressed in mg/L calcium carbonate

Appendix C

Swan Lake, Center: Historic Concentrations of Sulfate in Water Samples Collected at Lake Surface, 2005-2009



Appendix D

2010 Wild Rice Management Workgroup "350 Significant Wild Rice Waters in Minnesota" (updated on May 4, 2010)

350 Significant Wild Rice Waters in Minnesota

This is laid of 80 of the most important will be received in Minnesota with the most important will be reviewed in Minnesota with the most important will be reviewed in Minnesota with the most important will be reviewed in Minnesota with the most important will be reviewed in the residence of the second in the residence of the second in the residence of the review of the reviewed in the residence of the review of the review of the review in Minnesot in a second in the residence of the review of t

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.46	T Harden	Chical Mar.	1 STE	50	artical the way	Market Company	all a	A. Par	ALT.	تهر	2 registr	.4	Market Market	d	of the same	C fett.	And the second
Cala.	4 Pala	O _{Co}	OST N	Se A	See Age, Wage,	4P	420	Wagan.	William	436.00	Cht.	43/3	Orto, Orto	ONL.	ORIT	All I	aft ²
Aitkin Aitkin	White Elk Rice	01014800 01006700	780 3,635		1 M MNDNR - Wildlife/DU 0 USFWS - Rice Lake NWR	Rice thickest in south half of lake, band around north side. Rice is located in varying degrees across entire basis.	MUR	fair permit only	low	easy	Lake within Rice Lake National Wildlife Refuge.	WW	vc vc	Federal	USFWS		Rice thickest in south half of lake, band around north side. Rice is located in varying degrees across entire basis.
Aitkin	Flowage	01006100			140 USACOE - Sandy Lake RA	Can include almost complete coverage of south half of lake.	MICH	good only	moderate		Water level managed as part of the USACE Sar		VC VC	Federal	USAGDE		Can include almost complete coverage of south half of
																	Rice can cover almost all open water in basin, some holes
Altkin	Mallard	01014900	354	320	185 A MNONR - Wildlife	Rice can cover almost all open water in basin, some holes in		good	high	easy	Lake part of Ripple River State WMA. Water level managed as part of the USACE Sar	BDR	NatOut				in
Aitkin	Aitkin	01004000	850	298	11 USACDE - Sandy Lake RA	Around shoreline and outlet.		fair	fow	fair	Lake Recreati	WLM	VC	Federal	USACOE		Around shoreline and outlet.
										fair							
Aitkin	Shovel	01020000	230	207	36 M MNDNR-Wildlife/DU	Rice can cover almost entire open water area of basis.		fair	moderate	teer	Primary lake access is through private land. Water level managed as part of the USACE Sar	BOR udv	NatOut				Rice can cover almost entire open water area of basin.
Aitkin	Sandy River Lake	01006000			48 USACDE - Sandy Lake RA			fair	moderate		Lake Recreati	WLM	VC	Federal	USACDE		
Aitkin	Minnewawa	01003300		130	53 M MNDNR-Wildlife/DU	Rice east and northwest portions of the lake. Rice can cover almost entire open water area of basis.		fair	moderate			BDB	FC NatOut	State	MNDNR - Waters		Rice east and northwest portions of the lake. Rice can cover almost entire open water area of basis.
Annan	ranging	U100000				Total Carl Color annount of the Open Water area of Date.			III.OOH ALV	easy		u.v.	ranious.				NOTAL COST AMON WHEN SPECIAL STREET
Aitkin	Moose	01014000	148	117	77 A	Rice can cover almost entire open water area of basin.		good	moderate	easy	Lake adjacent to Hay Point State WMA.		NatOut				Rice can cover almost entire open water area of basin.
Aitkin	Bat House	01005300	122	100	2 M MNDNR - Wildlife/DU	Rice can cover almost entire open water area of basin.		fair	fow	fair		BDB	NatCur				Rice can cover almost entire open water area of basin.
											Water level managed as part of the USACE Sar						
Aitkin	Big Sandy	01006200	9,380	94	98 USACOE - Sandy Lake RA	Primarily in the Prairie River inlet flowage to lake.		fair	fow	casy	Lake Recreati Impoundment within Moose Wallow State	WEM	VC	Unknown	USACDE		Primarily in the Prairie River inlet flowage to take.
Aitkin	Moose River Pool	01035800	900	89	MNDNR - Wildlife			closed			WMA.	WLM	VC			Wild rice density is moderate (3), and its condition was goo	
Aitkin	Spruce	01015100	80	80		entire lake				difficul	1988: 76 acres. 1949: 80 acres (100%)						entire luke
Aithio	Newstrom	01009700	97	76	5 M MNDNR-WSMRe/DII	Rice can cover almost entire onen water area of basis		fair	low	6964	Lake within Newstrom State WMA	BDB	NatiOut				Size can cover about entire ones water area of basis
				,,,		Total carroom amon arrar open water a salor part.			1048	cary	take present respective and a series.						ince can cover amost entire open water area or basis.
Aitkin Aitkin	Salo Marsh State WMA Imp. Mud	01041500	690 135	76 68	MNDNR - Wildlife A MNDNR - Wildlife	Around shoreline of basin.		closed		difficul	Impoundment within Salo Marsh State WMA.	WUM BDR	VC NatOut			Wild rice density is lush (4), and its condition was excelle	Around shoreline of basin.
Aitkin	Mud Gun	01019400	735	60	A MNUNK-Wildline	Around shoreline of basin. NE bay.				easy		BDH	C				Around shoreless of bases. NE bers
Aitkin	Section Ten	01011500	440	52	1 M					easy						Wild rice density is lush (4), and its condition was excelle	
Aitkin	Ripple	01014600	676	50	6	Located on east and west ends of lake, also acres on Ripple		fair	low	easy			VC.				Located on east and west ends of lake, also acres on Ripple
Aitkin	Rock	01007200	356	50	•	country on that and west area or made, and act to an report			10.40	easy			**				1940-0
Aithin	Moose Willow WMA - Willow		900	50	MNDNS - WIHEL			closed			Impoundment within Moose Wallow State	WM	w	State	MNON8 - WZHEGO		
Artion	Moose Willow WMA - Willow	V P(01043100	900	50	MNDNR - Wildline			closed			Impoundment within Little Willow River State		WC	State	MNDNR - Widling		
Aitkin	Unnamed - Little Willow Rive	y W01033200	140	50	M MNDNR - Wildlife			closed			WMA.	WLM	VC			Wild rice density is scattered (2), and its condition was fa	
Aitkin	Rice	01000500	83	50	M MNDNR - Wildlife					difficul	Currently no rice: highwater - beavers, 1990: 68% rice	BDB	NetCut RPI	Private	Private		
											Upper end of Wankenabo: "88" - 20 to 30 yd r	ing					
Aitkin Aitkin	Waukenabo	01013600	819 442	49 45	1	Entire lake Largest stand in the NE.				nasy	around 70% o		VC NetOut	State	MNDNR - Waters		Entire lake Largest stand in the NE.
Aitkin	Elm Island	01012300			12	Primarily around inlet and outlet.		fair	fow	casy			NatOut				Primarily around inlet and outlet.
Aitkin	Sjodin	01031600	43	28	6	Most of lake except center				easy			NatOut				Most of lake except center
Aitkin Aitkin	Red Section Twelve	01010700	97 167	4	6	Around shore SE and NE edges.											Around shore SE and NE edges.
Aitkin	Prairie River	01/6			34												
Altkin Anoka	Ripple River Carlos Avery WMA - Pool 9	01r3 W9001009	269	120	12 MNDNR-Wildlife							WUM	VC DI	State	MNDNR		
Anoka	Carlos Avery WMA - Pool 3	W9001003		120	MNDNR-Wildlife							WUM	VC DI	State	MNDNR		
Anoke	Hickory	02009600	41		5				low		added from state harvester survey.						
Becker Becker	Big Basswood Chippewa	03009600		304 288	6 M R-WE 1 USFWS - Tamarac NWR		NDR	good good	low high	fair		WW	VC	Tribal Federal	R - WE USFWS - TamarackNWR		
Becker	Tamarack	09024100	2,227	245	USFWS - Tamarac NWR/WE			poor	low	easy		BDR	c	Federal	USFWS - Tamarack NWR		
Becker Becker	Rice Bork	03020100		245	USFWS - Tamarac MWR/WE 8-WF			good	high	easy			VC	Federal	USFW5 - TamarackNWR		
Becker	Little Flat	09029300		211	USFWS - Tamarac NWR/WE		WER	good	high	fair			NatOut	Federal	USFWS - Tamarack NWR		
Becker			3.943	197	22			tair			Bay inlet: 40 acres. NS: 5 acres, 5, 20, 4, 10. 3	0 ft	FC.	State			
Becker Becker	Height Of Land Flat	03019500			6 USFWS-TamaracNWR/WE			fair good	moderate high	easy fair	frin	WIM	FC FC	State Endered	MNDNR - Waters USFWS - TamarackNWR		
Becker	Rice	03029100		196	м				low								
Becker Becker	Shell Hubbel Pond	03010290 03024090		169 168	11 M 2 M			fair fair	moderate moderate		1993 data: 80 acres		VC Unknown	Private State	Bob Merritt-DL MNDNR		
Becker	Spindler	03021400		125	USFWS - Tamarac NWR/WE		WER	good	high	casy		BDR	NatOut	Federal	USFWS - Tamarack NWR		
Becker	Big Rat	03024690	1,102	110	R-WE		WBR	fair	moderate	easy							
Becker Becker	Buffalo Mud	03035000	464 88	89	1 R-WE	includes wild rice on Buffalo River.					1996 data		Unknown	Federal	USFWS - TamarackNWR		Includes wild rice on Buffalo River.
Becker	Schultz	03027800	103	82	м						Beaver MGD						
Becker Becker	Abners Lower Egg	03003900	100	80 75	M MNDNR-Wildlife/DU 9 USFWS-TamaracNWR/WE		WEB	good good	moderate			BOR	NacOur	Federal	USPWS - Tamarack NWR		
Becker	Trieglaff	03026300	111	56													
Becker	Winter	03021600	117	43	USFWS - TamaracNWR/WE		WEIR	fair	moderate	easy		WLM	WC	Federal	USFWS - Tamarack NWR		
Becker Becker	Booth Blackbird	03019800	48 284	43	USFWS - TamaracNWR/WE 4 USFWS - TamaracNWR/WE			fair good	low high	fair		BDR	NetOut NetOut	Federal Federal	USFWS - Tamarack NWR USFWS - Tamarack NWR		
Becker	Mod	03002300	85	42	Private				low			BDR					
Becker Becker	Two Inlets Johnson	03001700	643 181	40	1 Private LISEWS - Tamarac NWR/WF			fair noor	low low	easy	1995 data	BDR	FC NatDuri	State Federal	MNDNR USEWS - Tamarack MWR		
Becker	Bush	03021200	110	40	USFWS=TamaracNWR/WE		WEIR	good	hìgh	easy		WLM	VC VC	Federal	USFWS - Tamarack NWR		

	_e p		do		187	P. Maria	Trafe state		de	ger at tet	Safe a	get a		ar er	active active		A	A	nterto
	All Har	Charles High	May D.	A STED	de de	St. Marie	Alber"	. aler	Calle "	age V	get."	A. C.	· Article	-185.50	-Mar. St.	California (All Co	"Dige	a data
	ope Little Basswood	03009200	105	31	. 4	emc 4v	de.	WEIR	42	low	oasy.	or .	40	o,	or.	Tribal	8-WF	dr.	4º
	Cannan	03009200	217			USFWS-TamaracNWR/WE		WDR	fair	moderate	fair		BDR	FC		Federal	USFWS - Tamarack NWR		
	Upper Egg	03020600	493			USFWS - TamaracNWR/WE		WEIR	poor	low	fair			NetOut		Federal	USFWS - Tamarack NWR		
	Cabin Little Round	03034600 03030200	38 565		10 7 A	R-WE R-WE		WEIR		moderate low									
	Unnamed (Indian Creek impou		13		7 M				fair	moderate	easy			WC.					
	Big	04004900	3,565	250		R-LL/MNDNR - Fisheries	NW & W bays.	LUR	fair	low	easy		BDR	NetOut					NW & W bays.
į.	Puposky	04019800	2,120	236	м				poor	low	fair								
	Rabideau Bootleg	04003400	723 308		33 M				poor	high low	fair			FC NatDut	Old	Federal	USFWS		
	Kitchi	04021100	1.850	185		R-LL	Creek to Little Rice.	LUR	poor	low	fair			NatOut					Greek to Little Rice.
i	Manomin	04028600	288			MNONR - Wildlife			good	moderate	fair		BDR	NatOut					
1	Pimushe	04003200	1,350		I M		NW bay.	LUR		low	fair								NW bay.
	Three Island Rice Pond	04013400	836 247	125 123	2 M	MNDNR - WildEfe			ecod	low	many	Within Rice Pond State Waterfowl Refuge.	BDR	FC NatOut		County	Co. Park		
	Burns	04000100	131	105		R-LL		LUR	1000	low	difficul	The state of the s		NatDut					
i	Irving	04014000	644	97			NW buy.				fair			NetOut					NW bay.
	Big Rice Monte	04003100	542 517	96 96		R-LL R-LL	N. & SW bays.	LUR	good	moderate low	difficul fair			NatOut NatOut					N. & SW bays.
	Little Poposky	04001100	158	95	М	W.C.	n. ac and page.	COR	poor	IOW	886V			NatOut					n. a sw pays.
i	Medicine	04012200	458	69	M		SW bay.				fair								SW buy.
i .	Little Rice	04001500	123	60		R-LL	Around shoreline and inlet/outlet.	LUR	good	low	difficul	added from lonr.shp		NatOut					Around shoreline and inlet/outlet.
	Erickson Cranberry	04006800 04012300	111 77	50 46	1 M					low	difficul	Early 80's data		NatOut					
	Classery	04015300		40	T 80					1011		Ca 1/ 00 3 0010		Netosi					
à	Turtle River	04011100	1,664		15					moderate		No rice known to occur on lake, rice only in rive	r.						
	Long Tamarack Siver	9006600					rice along shore, thick in inlet and NW portion good stands in several stretches												
	Perch	09003600	796	597		R-FDL	good states of s	1854, FDU	IR			1997 data		VC		Tribal	R-FDL		
	Kettle	09004900	611			MNONR-Wildlife		1854	good	moderate	easy		BDR, BR						surveyed annually by 1854 Treaty Authority
	Miller Rice Portage	09005300	156 832	156 120		R-FDL R-FDL		1854, FDU 1854, FDU		high high		100 acres of open water (75% rice)	BDR, D	VC.		Tribal	R-FDL		
	nice vortage	09003700	032	120	1	NT DC		1034, FUU	in .	nign		1987: 75%, 1997: 50%. History of beaver	BUN, D	VL.		THOM	H-FDC		
	Dead Fish	09005100				R-FDL		1854, FOUR		high		problems - plugged		Unknown		Tribal	R-FDL		
	Jaskeri Moose Horo River	09005000 09r1	74 123	74 61		R-FDL	wide slow section of river extending from Moose Lake into Pine C	1854, FDU	IR	high			BDR, D			Tribal	R=FDL		
	Tamereck	09006700		59.0	11		wide slow section of river extending from Moose Lake Into Pine C	cunty			1997 dete	s, 2009 Survey							
	bland	09006000	456	46	7					low		1997 data: 10% of Lower Island Lake							
	Tamarack take	9006700	228 215				stands in narrows and in river rice along shore, some denser areas/bays												
	Wild Rice	9002300	213			Fond du Lac Reservation	sparserice over most of lake												
	Little Kettle	9007700					can have good stands over about three-fourths of lake												
	Leeds	11020300	100 117	4.000	27	USACOF - Leech take RA	Bear I.; Blackduck & Grassy Pts; Boy, Federa Dam & Headquart	R-LL	good	high	casy		WIM	w	LISACOF date	Federal	USACDE		Bear I.; Blackduck & Grassy Pts; Boy, Federa Dam & Headquart
	ceeds	11020500	109,413	4,000	27	OSACOE - DECIT LINE NA	Bear I., Blackbuck & Glassy Pts, Buy, Federa Dalli & Readquart	M-FT	Rood	nign	cusy		AACM	**	OSACOE Gani	reuera	USACUE		Historic coverage of approx. 60%, best stands along north
	Big Rice					MNDNR-Wildlife/DU	Historic coverage of approx. 60%, best stands along north an		fair	moderate	cesy	State Waterfowl Feeding and RestingArea.		FC	Stoplogs	State	MNDNR		en .
	Mud	11010000	1,440	1,300	35	MNDNR - WIMESte	Found over extensive areas of the lake.	LUR	good	high	casy	Within Mud-Goose State WMA.	WLM	WC		State	MNDNR		Found over extensive areas of the lake. Third River flowage (500 acres), Raven flowage (450
	Winnibigoshish	11014700	69,821	1,000	24	USACOE - Winnibigoshish L RA	Third River Bowage (500 acres), Raven Bowage (450 acres),	LUR		high			WLM	vc	Sliding grate	Federal	USACCE		acres),
	Laura	11010400	1,424	854	9 M	MNDNR - Wildlife/DU	Northern 2/3rds of main lake and east, south bays.		fair	moderate	easy		80R	NatOut					Northern 2/3rds of main take and east, south bays.
	Goose	11000000	844	844	2	MNDNR-Wildlife	In good years, almost 100% coverage of open water area.		good	moderate	easy	Within Mud-Goose State WMA, water levels managed by dam on M	BDB	vc	Sliding grate	State	MANDAR		In good years, almost 100% coverage of open water area.
	Boy	11014300	5,544			R-U.	in good years, aimost zuus coverage or open water area.	LUR	good	high	easy	managed by dam on M	BOK	NatOut	siding grate	State	MINUNH		in good years, almost 100% coverage or open water area.
																			Fairly continuous coverage in north bay and in a band
	George	11010100	720 282	262 197		MNDNR - Wildlife/DU R-U	Fairly continuous coverage in north bay and in a band along	LUR	poor	low	easy		BDR BDR	VC		State	MNDNR - Waters		along
	Lomish Rice	11016200	342	137		w.rr		LLIK	good good	moderate moderate	easy	1997 data	BUK	NatOut					
																			it was found along the river channel throughout the
	Gull River	1111				Industrial - MN Power	It was found along the river channel throughout the surveyed		fair	fow	fair			VC		Industrial	Industrial - MN Power	There were several very thick stands of Rice although most a	surveyed
	Rice (Pillager) Lind (Lindsey)	11032100	232 462		12 A 18	MNDNR - Wildlife/Private	Wild rice stands can occupy up to 80% of basin area.		fair fair	moderate moderate	difficul		BDR	NatOut		Private	Private		Wild rice stands can occupy up to 80% of basin area.
	McCarthey	11016800	194	78		Private			fair	low	difficul	1994 data	BDR	MALOUR		Private	see Ray file		
												only current public access is Potlatch land on SV	N						
	Farnham Six Mile	11051300	142	71		MNDNR-WildEfe LEFS	25% in an average year to 100% in a good year.	LUR	fair poor	low	fair	corner of	BDR	NetOut VC		Private		typically moderate	25% in an average year to 100% in a good year.
	Washburn	11005900	1,768	60					,,,,,,	1011				FC		State	MNDNR-Waters		
	Brockway	11036600	182	55	14				good	moderate	essy	1996 dete							
	Woman	11020100	5,360	54	2 M				fair	low	cesy	Latern Bay, Broud Water, Narrows, Dam on Girl Lake, Otter Ba		FC.		Unknown			
	Swift	11013300	359	51										NatOut					
	Chuls	11051700	57 297	51		R-LL MINIONE - WINING/DU		UR	good	moderate	easy	Within Mud-Goose State WMA.	BDB	NatOut					
	Twin	11012300	297	50	м	MNDNR - WIMIRE/DU					difficul	Added to MNDNR Brainerd's management list i		С		Federal	USPWS		Center and eastern portions of basin, illy pads dominated
	Lower Hand	11025100	122	50	M	MNDNR - Wildlife	Center and eastern portions of basin, klypads dominated we		poor	low	difficul	2007.	BDR	NatOut		County		moderate in 2007	we
	Lizotte	11023100	75	50		MNDNR-Wildlife	Wild rice can over a majority of basin in a good year.		fair	low	fair		BDR	NatOut					Wild rice can over a majority of basin in a good year.
	Rice (Carrol's)	11022700	46	46			Wild rice can completely cover open water portion of basin.					Privately managed wild rice bed.							Wild rice can completely cover open water portion of besin.
	Big Birch	11001700	255	45	м	?	The second secon					yyou and the best		NatOut					
	Pine Mountain	11041100	1,657	40					fair	low	casy								
	Hattie Beuber	11023200	592 135	40 15	14		Fair band along shoreline.		fair	moderate	cosy	1997 Data: 150 ft fringe of rice all around							Fair band along shoreline.
	Island	11010200	390	10	8		in various bays.				.407	and a second range or race or of Odding						scarce	In various bays.

Declare Service of the Control of the Control of Contro

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eth.	in Harry	Gath Hig.	N FOR	sco.	artife at the	Alte Care	ď	44.00	ark pro	es. d	e and the second	A	State State State State	A	at the	O. March	de la companya de la
CON.	*	11014500	976 376	1/2	* GET GET 11 MNONE - WEIGHT-/R-11	ario.	LUB	44.	low.	Killer.	State Waterfood Refuge	BDR BDR	Order Order	Qu.	Gg.	Marin Control	#
Cass Cass	Drumbeater Moose	11014500	92	1	11 MNUNK-Widite/K-LL 5	Practically no rice present.	LUK	poor	low	difficul	State Waterfowl Heruge.	BDH	NatOut				Practicallyno rice present.
Cass	Portage	11047600	277		5												
Clearwater	Lower Rice Upper Rice		2,375 1 1,860 1		44 R-WE 25 M MNDNR-Wildlife/WE		WEIR	good	high high	masy	Good regular producer Adjacent to Upper Rice Lake State WMA.		VC Double log	Tribal State	R - WE MNDNR - Wildlife		
Clearwater	Pine			220	Red Lake Watershed District				-	easy	Adjacent to Pine Lake State WMA.		WC .	State	MNONR - Fisheries		
Gearwater	Mud	15006100	294	103	17 M	wide band of rice around most of lake except pars of the wes			moderate	may	Adjacent to Mud Lake State WMA. Potential for management, of	r					wide band of rice around most of lake except pars of the
Clearwater	Unnamed	15002100	150	45	м					difficul							
Gearwater	Minerus Sucker	15007900 15002000	239 90	36 14	13 A R-WE				moderate	easy	Adjacent to Sucker Lake State WMA.						
Clearwater	Clearwater River	15/1			15				moderate								
Cook	Marsh Swarm River	16048800	165	153	1	52 acres in 1998, less in 99-01, typically sparse to fair coverage	1854	anat	low	many			c	State	State		
Cook	Northern Light	16008900		133	USFS		1854	fair		easy		WUM	FC	Federal	USFS		
Cook	Elbow	16009600	415	124	5		1854	fair	low	easy							
Cook	Rice	16045300	230	92	1		1854	fair	low	fair	1997: 92 acres (40%), normally 20% as in 1998.						
Cook	Kelly	16047600	188	56			1854	poor		difficul	1997 data: very consistent in rice production -			Federal	USFS - BWCA		
Cook	Moore	16048900	64	48			1854	poor		easy	really spars						
Cook Cook	Fourmile Mark	16063900 16025000	593 140	42	2	can have good rice over most of lake, used by harvesters	1854	fair	low	easy							
Cook	South Fowl	16003400	1,440			moderate to dense patches of rice											
Cook Crow Wine	North Fowl Lower Dean	16003600 18018100	1,020 372	260	62 M MNDNR - Wildlife	moderate to dense patches of rice Wild rice can completely cover basin.		ecod	histh	easy	Lake adjacent to Lower Dean State WMA.	BDR	NetOut				Wild rice can completely cover basin.
Crow Wing	Platte				I A MNONR - Waters	Wild rice located in NW bay, around shoreline.		poor	low	casy	Later appears to contain country and winds.	WLM	FC	State	MNONR - Waters		Wild rice located in NW bay, around shoreline.
Crow Wine	Duck	18017800	210	175	3 M MNONR - Wildlife	Wild rice can completely cover open water portion of basin (fair	low	casy	Lake within Duck Lake State WMA.	ww	VC.	State	MNDNR - Wildlife		Wild rice can completely cover open water portion of basin (
_											CONCENSION DATE LAKE STATE WHITE		**				Wild rice densest in northern 2/3rds of basin, around
Crow Wing Crow Wing	Rice (Deenwood) Rice (Hesitation WMA)	18006800			7 A MNDNR-Wildlife 10 M MNDNR-Wildlife/DU	Wild rice densest in northern 2/3rds of basin, around shore Wild rice densest in western 2/3rds of basin		fair fair	moderate	easy	Lake within Hesitation State WMA	BDR	C FC	County	County MNDNR - Fisheries		shore Wild rice densest in western 2/3rds of basin.
_										,	Case William Francisco Al State William						
Crow Wing	Rice (Clark take)	18032700	181	124	M MNDNR - Wildlife/DU	Wild rice can completely cover basin, open in the middle.		fair	low	fair		BDR	c	County	Co. DOT		Wild rice can completely cover basin, open in the middle. Wild rice located around east, north and outlet portion of
Crow Wing	tizzie	18041600			17	Wild rice located around east, north and outlet portion of b			low			2	FC	State	MNDNR - Waters		b
Crow Wing Crow Wing	Garden Nelson	18032900 18016400		100	1 M MNONR - WildEfe/DU	Wild rice denest along east shore and north bay. Wild rice located in west half of lake.		poor	low	fair		BDR NA	C NatOut	County	Co. DOT		Wild rice denest along east shore and north bay. Wild rice located in west half of lake.
Crow Wing	Hole-in-the-Day	18040100	217	90	MNDNR-Wildlife	Wild rice is densest in northern 2/3rds of basin.		fair	low	easy	Within City of Msswa wildlife refuge.	BOR	c		MNDOT		Wild rice is densest in northern 2/3rds of basin.
Crow Wing Crow Wing	Hole- in-the-Day Rice (Pratt's)	18040100 18031600	217 100	90 90	MNDNR - Wildlife MNDNR - Wildlife	Wild rice is densest in northern 2/3rds of basin. Wild rice can completely cover basin.		fair poor	low	easy difficul	Privately managed wild rice lake (Pratt).	80R	C NatOut		MNOOT		Wild rice is densest in northern 2/3rds of basin. Wild rice can completely cover basin.
				90					low			80R	C NatOut NatOut		MNDOT		
Crow Wing Crow Wing	Rice (Pratt's) Unnamed (Lost Rice)	18031600 18022800	157	90	MNDNR-Wildlife M MNDNR-Wildlife	Wild rice can completely cover basin. Wild rice can completely cover basin.		poor	low	difficul difficul	Privately managed wild rice lake (Pratt). Large, 6' beaver dam removed in 2006, scatter rice coverag	BDR ed BDR	NatOut	County		. WSU circulated by it modernees to but hill or of it med the cond	Wild rice can completely cover basin. Wild rice can completely cover basis.
Crow Wing Crow Wing Crow Wing	Rice (Pratt's) Unnamed (Lost Rice) Oog	18031600 18022800 18010700	100 157 71	90 80 71	MNDNR - Wildlife	Wild rice can completely cover basin. Wild rice can completely cover basin. Wild rice is found throughout the lake area in stands of var		poor		difficul	Privately managed wild rice lake (Pratt). Large, 6' beaver dam removed in 2005, scatters	BDR BDR BDR	NatOut VC	County	MNDOT Co. DOT	Wild rice density is moderate to lush (3 or 4), and its cond	Wild rice can completely cover basin. Wild rice can completely cover basin. Wild rice is found throughout the lake area in stands of var
Crow Wing Crow Wing Crow Wing Crow Wing	Rice (Fratt's) Unnamed (Lost Rice) Oog Pine	18031600 18022800 18010700 18026100	100 157 71 391	90 80 71 60	MNDNR-Wildlife M MNDNR-Wildlife	Wild rice can completely cover basin. Wild rice can completely cover basin. Wild rice is found throughout the lake area in stands of var Wild rice is found throughout the lake area in stands of var		poor	low	difficul difficul	Privately managed wild rice lake (Pratt). Large, 6' beaver dam removed in 2006, scatter rice coverag	BDR ed BDR	NatOut	County		Wild rice density is moderate to lisib (3 of 4), and \gtrsim cond	Wild rice can completely cover basin. Wild rice can completely cover basis. Wild rice is found throughout the lake area in stands of var Wild rice is found throughout the lake area in stands of var Wild rice located along east shore, Pine River cheanel.
Crow Wing Crow Wing Crow Wing	Rice (Pratt's) Unnamed (Lost Rice) Oog	18031600 18022800 18010700 18026100 18032600	100 157 71 391 82	90 80 71	MNDNR-Wildlife M MNDNR-Wildlife	Wild rice can completely cover basin, Wild rice can completely cover basin, Wild rice is found throughout the labe area in stands of var Wild rice loss found throughout the labe area in stands of var Wild rice covered along east shore. The filter channel. Wild rice can cover a majority of open water basin.		poor	low	difficul difficul	Privately managed wild rice lake (Pratt). Large, 6' beaver dam removed in 2006, scatter rice coverag	BDR BDR BDR	NatOut VC	County		Wild rice density is moderate to liush (3 or 4), and its cond	Wild rice can completely cover basin. Wild rice can completely cover basin. Wild rice is found the coughout the take area in stands of var Wild rice is found the coughout the take area in stands of var Wild rice to found a long must shore. Place filter channel. Wild rice was found throughout the green water basin. Wild rice was found throughout the green water area of
Crow Wing Crow Wing Crow Wing Crow Wing	Rice (Fratt's) Unnamed (Lost Rice) Oog Pine	18031600 18022800 18010700 18026100	100 157 71 391	90 80 71 60	MNDNR-Wildlife M MNDNR-Wildlife	Wild rice can completely cover basin. Wild rice can completely cover basin. Wild rice is found throughout the lake area in stands of var Wild rice is found throughout the lake area in stands of var		poor	low	difficul difficul	Privately managed wild rice lake (Pratt). Large, 6' beaver dam removed in 2006, scatter rice coverag	BDR BDR BDR	NatOut VC	County		. Wild rice density is moderate to lash () or 4), and its cond	Wild rice can completely cover basin. Wild rice can completely cover basis. Wild rice ican cover analysis of copy must be label. Wild rice can cover analysis of copy must be label. Wild rice can cover analysis of copy must be label. Wild rice can cover analysis of copy must be label.
Crow Wing	Rice (Pratt's) Llanamed (Lost Mice) Dog Pine Mud Rice (Blomberg's) Terry	18031600 18022800 18010700 18026100 18032600 18012100 18016200	100 157 71 391 82 78	90 80 71 60 60 00	MNONE - Widlife M MNONE - Widlife M MNONE - Widlife 1 M MNONE - Widlife	Wild rice can completely cover basin, Wild rice can completely cover basin, Wild rice is found throughout the labe area in stands of var Wild rice loss found throughout the labe area in stands of var Wild rice covered along east shore. The filter channel. Wild rice can cover a majority of open water basin.		poor	low low	difficul difficul	Printely messaged wild rick bety Prett. Lagge, IP beyond an removed in 2006, scatters rice scowing. MNIONR designated Game Lake.	BDR BDR BDR BDR	NacOut VC RD NetOut NacOut		Co. DOT	Wild rice density is moderate to look (3 or 4), and its cond	Wild rice can completely cover basin. Wild rice can completely cover basin. Wild rice is found the coughout the take area in stands of var Wild rice is found the coughout the take area in stands of var Wild rice to found a long must shore. Place filter channel. Wild rice was found throughout the green water basin. Wild rice was found throughout the green water area of
Crow Wing Crow Wing Crow Wing Crow Wing Crow Wing Crow Wing	Rice (Fratt's) Linnamed (Lost Rice) Dog Pine Mud Rice (Blomberg's)	18031600 18022800 18010700 18026100 18032600 18012100 18016200	100 157 71 391 82 78	90 80 71 60 60 00	MNONE - Wildlife M. MNONE - Wildlife M. MNONE - Wildlife	Wild rice can completely conver basin. Wild rice can completely conver basin. Wild rice is found throughout the lake or ora in stands of var Wild rice is found along east shore. Fine River channel. Wild rice (accord along east shore, Fine River channel. Wild rice concern a majority of organ water fasilin. Wild rice was found throughout the open water area of the ba		poor poor poor	low low low	difficul difficul easy fair	Privately managed wild rice lake (Pratt). Large, 6' beaver dam removed in 2006, scatter rice coverag	BDR BDR BDR NA NA	NatOuri VC RD NotOut	County		With rice-density is moderate to lipik (3 or 4), and its cond	Wild from an completely cover basis. Wild from an completely cover basis. Wild from an completely cover basis. Wild from an an experiment of the area in stands of our stall for covered being must alway. Proceeding the country, with the contractions an analysis of community of community and the contractions an analysis of community and the contractions and supply of grown water basis. Wild from an analysis of the complete area of the law. Wild from concern one analysis of open water portion of ball
Crow Wing	Rice (Pratt's) Llanamed (Lost Mice) Dog Pine Mud Rice (Blomberg's) Terry	18031600 18022800 18010700 18026100 18032600 18012100 18016200	100 157 71 391 82 78	90 80 71 60 60 00	MNONE - Widlife M MNONE - Widlife M MNONE - Widlife 1 M MNONE - Widlife	Wild rice can completely conver basin. Wild rice can completely conver basin. Wild rice is found throughout the lake or ora in stands of var Wild rice is found along east shore. Fine River channel. Wild rice (accord along east shore, Fine River channel. Wild rice concern a majority of organ water fasilin. Wild rice was found throughout the open water area of the ba		poor poor poor	low low low	difficul difficul easy fair	Printely messaged wild rick bety Prett. Lagge, (P beyer dan removed in 2006, scatter rice scowers) MNDNR designated Game Lake.	BDR BDR BDR NA NA	NacOut VC RD NetOut NacOut		Co. DOT	Will fine density is moder at to last () of θ_i and its cond	Wild rice can completely cover basin. Wild rice can completely cover basin. Wild rice is found the coughout the base area in stands of var Wild rice is found the coughout the base area in stands of var Wild rice count cover as waiperly of som water basin. Wild rice van cover a swaiperly of som water basin. Wild rice van found throughout the open water area of the ba. Wild rice van cover a majority of open water portion of
Crow Wing	Rice (Pratt's) Unnamed (Lost Wee) Dog Pine Mud Rice (Blomberg's) Terry Upper Whitefish Lower Mission	18021800 18022800 18010700 18026100 18032600 18012100 18016200 18034000	100 157 71 391 82 78 102 7,969 739	90 80 71 60 60 60 55 50	MMONR - WIGHE M MNONR - WIGHE M MNONR - WIGHE 1 M MNONR - WIGHE 1 USACOL - Crossière RA	Wild rice and completely cover basis. Wild rice is found throughout the lake area in stands of our wild rice is found withoughout the lake area in stands of our wild rice founded large and whom, fine filter themself. Wild rice can cover a majority of one water basin. Wild rice was found throughout the cope water area of the bawling rice area of the bawling rice area over a majority of open waters portion of basis. Wild rice can cover a majority of open waters portion of basis. Wild rice date cover a majority of open waters go richoo of basis.		poor poor poor	low low low	difficul difficul easy fair	Printely messaged wild rick bety Prett. Lagge, (P beyer dan removed in 2006, scatter rice scowers) MNDNR designated Game Lake.	ed BOR BOR NA NA BOR	NatOut VC RD NetOut NatOut VC		Co. DOT	WMI rice-density is moderate to hash [3 of 4], and its cond	Wild fice an competently over basin. Wild fice as competently over basin. Wild fice as found throughout the late area is stands of your basis. Wild fice is found along must above. Plots Siver channel. Wild fice located along must above. Plots Siver channel. Wild fice as comes an adoptive of even water basin. Wild fice as found an adoptive of even water area of the late. Wild fice an over a majority of open water portion of the late. Wild fice density was scattered to moderate (2 to 5), and of
Crow Wing	Rice (Frant's) Unnamed (Lost Rice) Dog Pine Mud Rice (Blomberg's) Terry Upper Whitefals Lower Mission Strich Rice Red	18031600 18022800 18010700 18026100 18032600 18012100 18016200 18016200 18024300 1802800 1802800 1802800	100 157 71 391 82 78 102 7,969 739 486 50	90 80 71 60 60 60 55 50 50 49 47	ANDONAL WHITE M MADONE WHITE M MECINE WASHE 1 M MICINE WASHE 1 VSACUT Crossine PA A MICINE WASHE MADONE WASHE	Wild rice and completely cover basis. Wild rice and completely cover basis. Wild rice boat with throughout the biles or an in stands of our Wild rice boat with throughout the biles or an in stands of our Wild rice boarded along east abore. Pine River channel. Wild rices boarded along east abore. Pine River channel. Wild rices cover a supplying of open water basis. Wild rices do not cover a majority of open water portion of basis Wild rice can cover a majority of open water portion of basis Wild rice dependently was scattered to moder atte (2 to 3), and it a Wild rices completely cover basis.		poor poor poor fair fair	low low low low	difficul difficul easy fair difficul difficul	Printely messaged wild rick bety Prett. Lagge, (P beyer dan removed in 2006, scatter rice scowers) MNDNR designated Game Lake.	BDR BDR BDR BDR NA NA BDR WUM BDR	NatOut VC RD NetOut NatOut VC	Federal	Co. DOT USACOE, Part of Rice River Res. System	Wild river-density is moderate to lauk (3 or 4), and 2n cond	Wild from an completely cover babin. Wild from an completely cover babin. Wild from an completely cover babin. Wild from back of the completely cover babin. Wild from backed along out shore, Plane River channel. Wild for backed along out shore, Plane River channel. Wild for backed along out shore, Plane River channel. Wild for backed along out shore, Plane River channel. Wild for can cover an majority of open swater portion of back. Wild for density was scattered to moderate (2 to 3), and at 1. Wild for chancel on Viv bay were and east short-direct. Wild for chancel on Viv bay were and east short-direct.
Crow Wing Crow W	Rice (Fratt's) Unnamed (Lost Rice) Dog Pine Mod Rice (Blomberg's) Terry Upper Whiteful Lower Mission Smith Rice Bed	18031600 18022800 18010700 18026100 18032600 18012100 18016200 18016200 1802400 1802800 18018200 18018200	100 157 71 391 82 78 102 7,969 739 486 50 320	90 80 71 60 60 60 55 50 49 47 45	MMONR-WIGHE M MNONR-WIGHE M MNONR-WIGHE I M MNONR-WIGHE I USACOL-Crosslete RA A MNONR-WIGHE	Wild rice can completely come basis. Wild rice is not empletely come basis. Wild rice is found throughout the lake or an in stands of var Wild rice founded lang east above, fine till land throughout the founded. Wild rice founded lang east above, fine till land throughout the open water area of the ba Wild rice was found throughout the open water area of the ba Wild rice was found throughout the open water portion of basi Wild rice found or an appropriate of open water portion of basi Wild rice found or an appropriate of open water portion of basi Wild rice found and water for those date as the order. Wild rice found and water found and east shorelose.		poor poor poor fair fair	low low low low	difficul difficul easy fair difficul	Printely messaged wild rick bety Prett. Lagge, (P beyer dan removed in 2006, scatter rice scowers) MNDNR designated Game Lake.	BDR ed BDR BDR NA NA BDR WLM	NetOut NetOut NetOut VC RD NetOut VC VC 7		Co. DOT	Wild rise-density is moderate to hash [3 of 4], and to cond	Wild rice on completely over boin. Wild rice is bound throughout the late area is stands of year white in the completely over boin. Wild rice is found throughout the late area is stands of year white in concern does must shore. Fine Nilser shamed, whild rice can cover a majority of one year bound. Wild rice are cover a majority of one year water persons of white is as a standard or throughout throughout through year through years are of years are of white is a standard or throughout throughout throughout through years are of years are with rice of years are one or a majority of one water portion of book. Wild rice downward years are deserted to moderate (2 to 3), and it will rice for border in NVV big, west and east show dises. Wild rice downward around quality rice with rich tell (1).
Crow Wing	Rice (Frant's) Unnamed (Lost Rice) Dog Pine Mud Rice (Blomberg's) Terry Upper Whitefals Lower Mission Strich Rice Red	18031600 18022800 18010700 18026100 18032600 18012100 18016200 18016000 18024300 1802800 18018700 18018700 1800800	100 157 71 391 82 78 102 7,969 739 486 50 320 169	90 80 71 60 60 60 55 50 50	ANDONAL WHITE M MADONE WHITE M MECINE WASHE 1 M MICINE WASHE 1 VSACUT Crossine PA A MICINE WASHE MADONE WASHE	Wild rice and completely cover basis. Wild rice is found throughout the lake or an in stands of our Wild rice is found throughout the lake or an in stands of our Wild rice located along must obove, Theo Pierr Internet. Wild rice and cover a majority of open water basin. Wild rice and cover a majority of repen water area of the ba Wild rice can cover a majority of repen water or and of the basis Wild rice decided in Wild basis of the copy of the cover of the basis Wild rice decided in Wild basis of the cover of the basis Wild rice located in Wild basis, own basis. Wild rice located in Wild basis, own basis. Wild rice borned area and could rickly and least the following cover basis.		poor poor poor fair fair	low low low low	difficul difficul easy fair difficul difficul easy	Printely messaged wild rick bety Prett. Lagge, (P beyer dan removed in 2006, scatter rice scowers) MNDNR designated Game Lake.	BDR BDR BDR BDR NA NA BDR WUM BDR	NetOut NetOut NetOut NetOut VC VC VC VC 2 RADout C 2 RADout C 2 RADout C 2 RADout C 3 RADout C 4 RADout C 5 RADout C 6 RADout C 7 RA	Federal	Co. DOT USACOE, Part of Rice River Res. System	Will fine density is moderate to look () or 4), and its cond	Wild fine on completely over basis. Wild rice also completely over basis. Wild rice also condition of the late even is stands of our stands of our stands of the stands
Crow Wing Crow W	Rice (Fratt's) Unnamed (Lost Rice) Dog Pine Mod Rice (Blomberg's) Terry Upper Whiteful Lower Mission Smith Rice Bed	18031600 18022800 18010700 18026100 18032600 18012100 18016200 18016200 1802400 1802800 18018200 18018200	100 157 71 391 82 78 102 7,969 739 486 50 320	90 80 71 60 60 60 55 50 49 47 45	ANDONAL WHITE M MADONE WHITE M MECINE WASHE 1 M MICINE WASHE 1 VSACUT Crossine PA A MICINE WASHE MADONE WASHE	Wild rice can completely come basis. Wild rice is not empletely come basis. Wild rice is found throughout the lake or an in stands of var Wild rice founded lang east above, fine till land throughout the founded. Wild rice founded lang east above, fine till land throughout the open water area of the ba Wild rice was found throughout the open water area of the ba Wild rice was found throughout the open water portion of basi Wild rice found or an appropriate of open water portion of basi Wild rice found or an appropriate of open water portion of basi Wild rice found and water for those date as the order. Wild rice found and water found and east shorelose.		poor poor poor fair fair	low low low low	difficul difficul easy fair difficul difficul	Prizetoly managed with rice bits Grind, Tagger, of Beaver dam recovered in 2005, scatters rices scanney. MADCHRI designated Game Lake. 201 lake, Fine Bows Into lake 430.	BDR BDR BDR BDR NA NA BDR WUM BDR	NetOut NetOut NetOut VC RD NetOut VC VC 7	Federal	Co. DOT USACOE, Part of Rice River Res. System	Wild rise-density is moderate to hash [3 of 4], and its cond	Wild rice on completely over boin. Wild rice is bound throughout the late area is stands of year white in the completely over boin. Wild rice is found throughout the late area is stands of year white in concern does must shore. Fine Nilser shamed, whild rice can cover a majority of one year bound. Wild rice are cover a majority of one year water persons of white is as a standard or throughout throughout through year through years are of years are of white is a standard or throughout throughout throughout through years are of years are with rice of years are one or a majority of one water portion of book. Wild rice downward years are deserted to moderate (2 to 3), and it will rice for border in NVV big, west and east show dises. Wild rice downward around quality rice with rich tell (1).
Crow Wing	Rice (Frant's) Ulmammed (Lost Rice) Dog Pine Mud Rice (Blomberg's) Tetry Upper Whirefish Lower Mission Smith Smith Smith Smith Terry Terry Upper Whirefish Lower Mission	18031600 18022800 18010700 18026100 18032600 18012100 18016200 18016000 18024300 1802800 18018700 18018700 1800800	100 157 71 391 82 78 102 7,969 739 486 50 320 169	90 80 71 60 60 55 50 50 49 47 45 42	ANDONAL WHITE M MADONE WHITE M MECINE WASHE 1 M MICINE WASHE 1 VSACUT Crossine PA A MICINE WASHE MADONE WASHE	Wild rice and completely cover basis. Wild rice is found throughout the lake or an in stands of our Wild rice is found throughout the lake or an in stands of our Wild rice located along must obove, Theo Pierr Internet. Wild rice and cover a majority of open water basin. Wild rice and cover a majority of repen water area of the ba Wild rice can cover a majority of repen water or and of the basis Wild rice decided in Wild basis of the copy of the cover of the basis Wild rice decided in Wild basis of the cover of the basis Wild rice located in Wild basis, own basis. Wild rice located in Wild basis, own basis. Wild rice borned area and could rickly and least the following cover basis.		poor poor poor fair fair fair	low low low low low low	difficul difficul easy fair difficul difficul easy	Prizately managed with rice late Great Laught February data removed in 2005, scatters rise a coverage in 2006, scatters rise a coverage MMOHRR designated Genee Lake. 20-1 lelies, Pine Rows into lake 430. History of 50 to 100% coverage in the 1950s. &	BDR BDR BDR NA NA BDR WUM BDR BDR BDR	NetOut NetOut NetOut NetOut VC VC VC VC 2 RADOut C RADOut	Federal	Co. DOT USACOE, Part of Rice River Res. System	Wild rise density is moderate to look () at 43, and 8s used	Wild find on completely over basis. Wild find bounded along must along. Plan Silver discount, which is completely over basis. Wild find on completely over basis. Wild find on the completely of over basis or basis of the basis. Wild find on completely over basis on white profices of basis. Wild find on completely over basis. Wild find document over a majority of open water profices of basis of the completely over basis. Wild find find document over a majority of open water basis. Wild find food control in NV bing, west and deast short-direct, Wild find food control on NV bing, west and deast short-direct, Wild find food control on NV bing, west and deast short-direct, Wild find food control on NV bing, west and deast short-direct, Wild find food control on NV bing, west and deast short-direct, Wild find food control on NV bing, west and deast short-direct, Wild find food control on NV bing, west and deast short-direct, Wild find control on the NV bing, when the basis (Medbergs, Study, Stud
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Crow Wing Crow W	Rice (First Tri) Lionamed (Leet Rice) Dog Fire Mad Rice (Blomberg's) Tarry Unyer Whiterfalt Lower Mations First Fire Be Lower Mations First Fire Be Act and Active Lower Mation Matigate Act and Active Lower Matigate Lower Matigate Lower Matigate Act and Active Lower Matigate Lowe	18051600 180127800 180107700 180107100 180126100 180126100 18015200 18011000 18015200 18015000 18002800 18002800 18002800 18002800 18002800 18002800 18002800	100 157 71 391 82 78 102 7,969 739 486 50 320 169 85 345 285 166	90 20 21 21 22 22 22 22 22 22 22 22 22 22 24 20 20 20 20 20 20 20 20 20 20 20 20 20	MODULE WIRTH M MODULE WIRTH M MODULE WIRTH I M MODULE WIRTH I WINDOW WIRTH I WINDOW WIRTH A MODULE WIRTH A MODULE WIRTH LYACOE Cross Lake RA	With rice and completely come basis. Will rice is found introughout the late are in stands of our will rice is found introughout the late are in stands of our will rice sound any east above, fine time thannet. Will rice sound along east above, fine time thannet. Will rice sound an analysis of one waster area of the late. Will rice and sound throughout the open water area of the late. Will rice and one analysis of one waster portion of fasion. Will rice and one analysis of the one water portion of fasion. Will rice and one and the complete the one water portion of fasion. Will rice and one and one wastered to made at at D. 0.3, and if a will rice bounded and one of the one water and one of the one water and one of the one		poor poor poor fair fair fair poor poor	low	difficul difficul easy fair difficul difficul easy fair difficul	Prizately managed with rice late Great Laught February data removed in 2005, scatters rise a coverage in 2006, scatters rise a coverage MMOHRR designated Genee Lake. 20-1 lelies, Pine Rows into lake 430. History of 50 to 100% coverage in the 1950s. &	BDR BDR BDR BDR NA NA BDR WILM BDR BDR BDR	Nacional VC State of the Control of	Federal Twp Private	Co. DOT USACOE, Part of Fine Biner Res. System Trop	. Wild rise density is moderate to has $ 3 \times 4 \rangle$ and to cond	Wild rice as completely over boin. Wild rice is found throughout the late area is stands of var wild rice is found throughout the late area is stands of var wild rice is found throughout the late area is stands of var wild rice is come and throughout the pion Wild rice and come an analysis of one was the bound. Wild rice and come an analysis of one area was area of wild rice can come a majority of one was the protocol boar wild rice can come a majority of one of the protocol of boar wild rice and one of the protocol of boar wild rice and one of the protocol of boar wild rice and one of the protocol of boar wild rice and one of the protocol of boar wild rice and one of the protocol of boar wild rice and one of the protocol of boar wild rice and one of the protocol of boar wild rice and one of the protocol of the protoc
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Grow Wing Grow Wing Conw W	Rice (First Tri) Cog Fire Mud Mic (Richery) Tory Love Wilson Firith Fire But Love Wilson Firith Fire But Love Wilson Wilson Firith Fire But Love Wilson Arrayhead Arrayhead Arrayhead Arrayhead Richeles Little Fire Richeles Richeles Little Fire Richeles Richeles Little Fire Richeles Rich	18031600 18022800 18012700 18012600 18032600 18012100 18012600 18012600 18012600 18012600 1802600 18016000 18016000 18016000 18016000 18016000 18016000 18016000 18016000	100 157 71 391 82 78 102 7,969 730 686 50 320 169 85 345 285 166 132 80	90 80 71 60 60 60 60 60 60 60 60 60 60 60 60 60	MODULE WHITE M MODULE WHITE I M MICROR WHIST I W MICROR WHIST I W MICROR WHIST I WAND WHITE I W MICROR WHIST I WAND WHITE A MODULE WHI	Wild rice and completely come basis. Wild rice is bound throughout the bale are in stands of our wild rice is bound throughout the bale are in stands of our wild rice is bound throughout the bale are in stands of our wild rice scored along east above, five five the basis. Wild rice scored along east above, five five thannet. Wild rice scored an example of open water basis. Wild rice are accord a majerty of open water portion of basis Wild rice accorded wild by the process of basis and the ball of the		poor poor fair fair poor poor poor poor poor poor poor po	Icone	difficul difficul easy fair difficul difficul difficul fair fair fair fair fair fair	Prizately managed with rice late Great Laught February data removed in 2005, scatters rise a coverage in 2006, scatters rise a coverage MMOHRR designated Genee Lake. 20-1 lelies, Pine Rows into lake 430. History of 50 to 100% coverage in the 1950s. &	BOR BOR WILM BOR	Nacion VC RD Nation VC VC Y Nation VC VC Y Nation Nation VC Nation	Federal Twp Private	Co. DOT USACOE, Part of Fine Biner Res. System Trop	. Will rise density is moderate to has by 3.4 d.), and its cond	Wild rice as competently over beats. Wild rice as found throughout the lake area is standard of var wild rice also control ethniques the lake area is standard of var wild rice for bound throughout the lake area is standard of var wild rice for bound at layer and short. Fine Niver hammed, wild rice an convey analysis of gene water basin, with rice and convey analysis of gene water basin. Wild rice and convey analysis of gene water portion of basin wild rice and convey analysis of gene water portion of basin wild rice and the standard of
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Grow-Wing Grow-Wing Chew-Wing Chew-W	Rice (First Tri) Dog Fire Much Mind Rice (Romberg V) Tery Lower Mission Strick Rice And Mission Strick Rice And Mission Strick Rice And Lower Mission Strick Rice And Lower Mission Strick Rice And Lower Mission Arrowhead Arrowhead Arrowhead Arrowhead Rice And Little Rice Little	18031000 18022800 18010700 18010700 18022800 18012100 18022800 18012100 18016200 18016200 18016200 18016200 18016200 18016200 18016200 18016000 18016000 18016000 180160000 180160000 180160000 180160000 180160000 180160000	100 157 71 391 82 78 102 7,969 50 320 109 85 345 285 166 132 80 133 277 405	90 80 71 60 60 60 60 60 60 47 45 42 42 40 40 40 40 21 1 2	MODULE WHITE M MICHAEL WISSIS I M MICHAEL WISSIS I M MICHAEL WISSIS I MANUAL WISSIS A MICHAEL WIS	Wild rice and completely come basis. Wild rice is bound throughout the bale are in stands of our wild rice is bound throughout the bale are in stands of our wild rice is bound throughout the bale are in stands of our wild rice scored along east above, five five the basis. Wild rice scored along east above, five five thannet. Wild rice scored an example of open water basis. Wild rice are accord a majerty of open water portion of basis Wild rice accorded wild by the process of basis and the ball of the		poor poor fair fair poor poor poor poor poor poor poor po	low	difficul difficul essy fair difficul difficul difficul difficul fair fair difficul fair	Prizerby managed with rice bits of min. Sagge of Sever of semonder 2005, scatter rises survey MADDRIR designand Gene Lake. 20-1 lake, Pine Bows into lake 430. History of 50 to 100% coverage in the 1950s & 60s. Brainend deac?	BOR EDR NA NA BOR NA NA BOR BOR NA NA NA BOR BOR NA NA NA NA BOR BOR NA	Nacion VC RD Nacion Nacion VC VC P Nacion VC VC Nacion Nac	Federal Twp Private Federal	Co. DOT USACOL, Part of Fine Bine Res, System Trop USACOL, Part of Fine River Res, System USACOL, Part Of L. Res System	Wild rise density is moderate to hash [3 of 4], and to cond	Wild rice as competently over beats. Wild rice as found throughout the lake area is standard of var wild rice also control ethniques the lake area is standard of var wild rice for bound throughout the lake area is standard of var wild rice for bound at layer and short. Fine Niver hammed, wild rice an convey analysis of gene water basin, with rice and convey analysis of gene water basin. Wild rice and convey analysis of gene water portion of basin wild rice and convey analysis of gene water portion of basin wild rice and the standard of
Crow-Write Grow-Write Crow-Write	Rice (First Tri) Lionamed (Levi Rice) Dog Fire Rice (Blomberg's) Terry Loyer Whitefall Lower Mission Settle Rice Ba Lower Mission Miss	18031600 18002800 18012700 18012700 18012700 18012600 18012600 18012600 18012600 18012600 18012600 18012600 18012600 18012600 18012600 1802600 1802600 18036000 18036000 18036000 18036000 18036000 18036000 18036000 18036000	100 157 71 391 82 78 102 7,969 50 330 320 169 85 345 285 165 132 80 133 277 405 405	90 80 71 60 60 60 60 60 60 60 60 60 60 60 60 60	MANUAL - Willise	Wild rice and completely come basis. Wild rice is bound throughout the bale are in stands of our wild rice is bound throughout the bale are in stands of our wild rice is bound throughout the bale are in stands of our wild rice scored along east above, five five the basis. Wild rice scored along east above, five five thannet. Wild rice scored an example of open water basis. Wild rice are accord a majerty of open water portion of basis Wild rice accorded wild by the process of basis and the ball of the		poor poor fair fair poor poor poor poor poor poor poor po	low	difficul easy fair difficul easy difficul easy fair fair fair fair easy fair easy fair easy	Prizately avanged with rice bits of min. Sagge of Sever of announced in 2005, scatters rise a converge in 2005, scatters rise and scatter rise and scatters rise an	BOR BOR WILM BOR	NanOut NanOut NanOut NanOut NanOut VC VC 7 NanOut C 7 NanOut C VC VC VC VC NanOut C 7 Na	Federal Twp Private Federal Federal Private	Co. DOT USACOL, Part of Flore Rises, Systems Top: USACOL, Part of Flore Rises Res., Systems	Wild rive density is moderate to look (3 of 4), and to could	Wild rice as competently over beats. Wild rice as found throughout the lake area is standard of var wild rice also control ethniques the lake area is standard of var wild rice for bound throughout the lake area is standard of var wild rice for bound at layer and short. Fine Niver hammed, wild rice an convey analysis of gene water basin, with rice and convey analysis of gene water basin. Wild rice and convey analysis of gene water portion of basin wild rice and convey analysis of gene water portion of basin wild rice and the standard of
Crow Wing Cone W	Roc (Forth) Dog Fire Much Mind Rice (Blomberg t) Tery Lower Maison Frieb Frieb	18931600 18002800 18010700 18010700 18010700 18010000 180100000 180100000 1801000000 1801000000 1801000000 1801000000 1801000000 1801000000 18010000000 18010000000 18010000000 18010000000 18010000000 18010000000 18010000000 180100000000	100 157 71 391 82 789 799 78	90 80 71 60 60 60 60 55 50 50 47 45 42 40 40 40 30 28 11 1 2 1 200 130 130 130	MANDAN-Willie M MANDAN-Willie M MANDAN-Willie 1 M MANDAN-Willie 1 MANDAN-Willie A MANDAN-Willie 4 MANDAN-Willie MANDAN-Willie MANDAN-Willie A MANDAN-Willie A MANDAN-Willie M M MANDAN-WILLIE M M M M M M M M M M M M M M M M M M M	Wild rice and completely come basis. Wild rice is bound throughout the bale are in stands of our wild rice is bound throughout the bale are in stands of our wild rice is bound throughout the bale are in stands of our wild rice scored along east above, five five the basis. Wild rice scored along east above, five five thannet. Wild rice scored an example of open water basis. Wild rice are accord a majerty of open water portion of basis Wild rice accorded wild by the process of basis and the ball of the		poor poor fair fair poor poor poor poor poor poor poor po	low	difficul easy fair difficul difficul difficul difficul easy fair difficul fair difficul easy fair easy fair easy fair easy fair	Prizerby managed with rice bits of min. Reg., of Beere deep convenient 2005, scatter rice convenient 2005, scatter rice convenient 2005, scatter rice convenient 2005, scatter MADDRIR designated Gene Lake. 20-1 lake, Pine Scene into lake 430. Wistory of 50 to 100% coverage in the 1950s & 65s. Backward daws? 397	BOR BOR WILM BOR	Nacion VC RD Nacion Nacion VC VC P Nacion VC VC Nacion Nac	Federal Twp Private Federal	Co. DOT USACOL, Part of Fine Bine Res, System Trop USACOL, Part of Fine River Res, System USACOL, Part Of L. Res System	Wild rise density is moderate to hash [3 of 4], and its cond	Wild rice as competently over beats. Wild rice as found throughout the lake area is standard of var wild rice also control ethniques the lake area is standard of var wild rice for bound throughout the lake area is standard of var wild rice for bound at layer and short. Fine Niver hammed, wild rice an convey analysis of gene water basin, with rice and convey analysis of gene water basin. Wild rice and convey analysis of gene water portion of basin wild rice and convey analysis of gene water portion of basin wild rice and the standard of
Crow-Write Grow-Write Crow-Write	Rice (First Tri) Lionamed (Levi Rice) Dog Fire Rice (Blomberg's) Terry Loyer Whitefall Lower Mission Settle Rice Ba Lower Mission Miss	18031600 18002800 18012700 18012700 18012700 18012600 18012600 18012600 18012600 18012600 18012600 18012600 18012600 18012600 18012600 1802600 1802600 18036000 18036000 18036000 18036000 18036000 18036000 18036000 18036000	100 157 71 391 82 78 102 7,969 730 466 50 120 169 345 285 166 132 80 127 107 107 107 107 107 107 107 107 107 10	90 80 71 60 60 60 60 55 50 50 47 45 42 42 40 40 30 28 11 2 1 200 118 90 90	MODULE - Willis M MADURE - Willis I M MICROE - Wilste I M MADURE - Wilste I M MADURE - Wilste I M MADURE - Wilste A MICROE - Cross-lake RA A MICROE - Wilste USACCE - Cross-lake RA A MICROE - Wilste M MADURE - Wilste M M M M M M M M M M M M M M M M M M M	Wild rice and completely come basis. Wild rice is bound throughout the bale are in stands of our wild rice is bound throughout the bale are in stands of our wild rice is bound throughout the bale are in stands of our wild rice scored along east above, five five the basis. Wild rice scored along east above, five five thannet. Wild rice scored an example of open water basis. Wild rice are accord a majerty of open water portion of basis Wild rice accorded wild by the process of basis and the ball of the		poor poor fair fair poor poor poor poor poor poor poor po	low	difficul easy fair difficul easy difficul easy fair fair fair fair easy fair easy fair easy	Prizately avanged with rice bits of min. Sagge of Sever of announced in 2005, scatters rise a converge in 2005, scatters rise and scatter rise and scatters rise an	BOR BOR WILM BOR	NanOut NanOut NanOut NanOut NanOut VC VC 7 NanOut C 7 NanOut C VC VC VC VC NanOut C 7 Na	Federal Twp Private Federal Federal Private	Co. DOT USACOL, Part of Fine Bine Res, System Trop USACOL, Part of Fine River Res, System USACOL, Part Of L. Res System	Wild rive density is moderate to look (3 of 4), and to coold	Wild rice as competently over beats. Wild rice as found throughout the lake area is standard of var wild rice also control ethniques the lake area is standard of var wild rice for bound throughout the lake area is standard of var wild rice for bound at layer and short. Fine Niver hammed, wild rice an convey analysis of gene water basin, with rice and convey analysis of gene water basin. Wild rice and convey analysis of gene water portion of basin wild rice and convey analysis of gene water portion of basin wild rice and the standard of

Hubbard Uppe Hubbard Third Hubbard Lake Hubbard Lake Hubbard Crow	t Crow Wing see Mud of Crow Weng e George e Alice w Wing ing Lake	29017700 2901800 29028400 29028400 2902700 29028600 29011600 29028400	564 50 636 882	58 50 50 40 18	2 M County 3 M 111 11 County		All freed in the second	Halfer	Saler Agent Fair Fair Fair Fair Fair	low low low low low low	difficul easy difficul easy easy easy	1997 data 1997 data Back placed to manage level. 1997 fairs. Back placed to manage level. Rack orader bridge-under 100 control level 1997 data	BDR BDR	C C C C	Health Spike Health Spike	Unknown	фф ¹ Со. DOT	**Oft	1
Inenti Uppe itasca Natu Itasca Borri Itasca Rice Itasca Pigeo Itasca Bass	ser Rice tures estring	30005700 31087700 31081300 31087600 31089400 31057600	208 2,885 2, 8,900 1, 911 511 2,844	499 1 335 : 729 500 427 :	1 MNDNR - WI 53 MNDNR - WI		Can cover a majority of basis in good years. Cov., Grause and Musiker buys.	R-LL LUR LUR LUR	good good fair good fair good	high high moderate high high moderate	fair fair easy easy many	Level affected by disch 1994 data, 1997:50%, in Bowstring River 1997 data, tofluenced by the Winnie dam	WLM WLM	NatiOut NatiOut NatiOut VC VC VC		Federal State Federal	USFWS MMDNR - Waters USACDE		Can cover a majority of basin in good years, Cow, Grouse and Modelett bays.
Resce White Resce Mud		31056100 31077600 31020600	905 271	271 : 203	10 USACOE - Po M		Eastern half of basin.	UR	fair fair fair	moderate low low	easy difficul	1997. Influence by Pokegawa Dam – USACDE History of beaver problems, private access.	WLM	VC VC NatOut	Sliding grate	Federal Federal	USACOE USACOE		Eastern half of basis.
Rasca Rabb Rasca Unite	le Cut Foot Sioux segama re en en on der		209 1,357 15,600 477 109 97 666	157 136 100 89 76 70 67 58		innibigoshish t. RA skegemama Lake RA lidilife/Dixon LA	Primarky in Utile Poloegama bay.	LLIR LLIR LLIR LLIR	fair good fair fair good	low moderate low moderate moderate low	easy	Bog problem, sometimes restrict soutlet. History of beaver problems.	WUM WUM WUM BDR BDR BDR BDR	VC NatOut VC VC NatOut NatOut ? NatOut NatOut	BPL		Federal USACDE USACDE R-LL SWCD, Dickson Lake Association		Primarily is Ettle Pokegama bay,
Itasca Savar	skberry	31006700 31021000	2,472		11 2 M MNDNR-Wi	idEfe/DU			fair	moderate low	fair	Also private management- lakeshore owners.	BDR	NetOut C		County	County		
	gel Irie	31037700	90		M 31 Industrial - N 74 18	ffN Power				high moderate	difficul fair	1997 date	BDR	NatOut NatOut NatOut Dam		Industrial	Industrial - MN Power		
		31r4	7,301 2, 734	000 ;	7 20 9			NUR		low		added from state harvester survey.							
Lake Bass Lake Story Lake Gard Lake Rice Lake Bong	nden e	38064500 38066000 38078200 38076200 38076200	409 4,236 206	245 : 212	12 2 Industrial - N	ffN Power	Black, Hoist, Rior, and Wind bays.		fair fair	moderate low	difficul difficul	1982 data- Sack bay: 150 acres, Wind bay: 205 acres, Hoist 1997 data 1997 data 1997 data	WLM	WC		industrial	industrial - MN Power		Black, Holes, Rice, and Wind beys.
take Woo Lake Hula Lake Lobo	a	38072900 38072800 38076600	121	125 121 99	3		NE Bay and Madden Cr. Bay lush, other areas scattered. Rice lush in bay by portage coming from Wood Lake.		fair fair	low	difficul difficul	1992 data						Wild rice density is moderate (3), and its condition was goo Wild rice density is sparse (1), and its condition was fair	NE Bay and Madden Cr. Bay fash, other areas scattered. Rice lash in bay by portage coming from Wood Lake.
Lake Musi		38078800 38041700	178	71	10 A MNDNR-W	NADA-AL-ENA	Can completely cover basin.	1854	poor	moderate		1970 data. Beaver problems	BDR			Federal	USFS-BWCA		Can completely cover basin. Surveyed annually by 1854 Treaty Auth
Lake Carry Lake Crare	npers	38067900 38001400	56	56	13 M	namy it i at	Can cover a majority of basin.	1854	fair fair	moderate	fair		DUIT					Average # stalks per 0.5 sq. meters is 21-40.	Can cover a majority of basin. Surveyed annually by 1854 Treaty Auth surveyed annually by 1854 Treaty Authority
Lake Cabie Lake Sand Lake Snow Cake Islan Lake Dum Lake Clark	ein d mwbank mad River mbbell rk	38026000 38073500 38052900 38084200 38039300 38064700	71 506 4,819 49 476 49	55 51 50 49 48	4 M 5 6		Can cover a majority of basin.	1854 1854 1854	good poor good fair fair	moderate low low moderate	fair fair easy easy	One bayhas rice, 50 acres at most						Average # of stalks per Q.5 sq. meter is 0°-20.	an wep as assuming the date is the promoting annually by 1854. Treaty Auch
Lake Ferm Lake Moo Lake Gego Lake Hoist Lake Hjah	errwood m ose prka st inner side McDougal		176 1,300 1,292 201 176 113 109 108		10		good stand on N end, rice coverage on S end also fair potential in some areas?, no field data free coverage over most of lake moderately detec on N end, sking shove, about 1/4 covered typically one-half on completely, covered with rice rice over about three fourths of life. The complete of the completely covered with rice one that of those countries one make the covered of the			low		added from 1854M list.							
Lake of the Woods Rose Lake of the Woods Rain, Lake of the Woods Wint Wille Lacs Once	ny River nter Road River	39/MP001 39/5 39/4 48000900	200		MNONR-WI					low fow		Rice acres have drastically declined in late 1990 added from state harvester survey, added from state harvester survey. 1964: 1350 acres of rice.	7's WUM	vc vc	DI	State	MNDNR Worers		
Mile Lacs Ernst	st Pool witt Mersh	48003600 48002000	300		MNDNR-W							Very good stand but poor seed production aga this year.	in BDR	vc vc		State	MNDNR-Wildlife	Wild rice density is ligh (4), and it conditions was fair (2	

											A		A.	a dame.				
		. are		de	6	la, " A	Greek date		Selfer.	i.	5500	gelft sets	A. C.	a threaten an order		A	.b·	All the second s
	Senti	alle the	State State	h ^{ar} de	Stan Back	AST AFF	alight."	, ager	all the	det.	gett.	and the second	refree and	J. St. Market Co.	A	At "	and per	and other
٥	,	*	φ. φ.	4	4n	Q. 4v.	4.	des	40	42	40	Water levels managed by outlet dam on Platte	és. G.	o-	o.	8	4	4.
Mo	orrison	Skunk	49002600	320	256	A MNONE-Wildlife	Throughout lake.		fair	low	essy	River, Rice Lak	WIM VC		State	MNONR - Wildlife		Throughout lake.
Mc	orrison	Rice	40002500	323	250	A MNDNR-WIMES	Excellent coverage at spots along shoreline in Rice Lake & n		fair	low	easy	Water levels managed by outlet dam on Platte Kiver, Rice Lak	WLM VC		State	MNONE - WildEleMNONE - WildEle		Excellent coverage at spots along shoreline in Rice Lake &
Mo	orrison	Twelve	49000600	159	80						difficul	Private access.			Private	Private		
	orrison ter Tail	Coon Ottertail River	49002000 56r1	75	75							Lake within Coon Lake State WMA.					common	
	ter Tail	Lake Sixteen		107	5													
	ter Tail	Star		0.90			historic rice camp											
Fir Fir		Crooked Hay Creek Flowage	58002600 58000500	94 66	85 5 40 5					low		1989 Survey	FC		State	MNDNR - Waters		
Pic		Willow River	58:1		- 6					low		added from state harvester survey.			June	minutes visited		
					54							Rice has been observed intermittently, also				MNDNR - WSHIN		
Nic	CIE .	Mud	66005400	269	54							noticed on past Typically 50 acres of rice, reaches 200 acres in			State	MNDNK - Wildlife		
Sco	ott	Fisher	70008700	396	190	USFWS - Minnesota Valley NWR				closed		good years.	C		Federal	USFWS		
	off	Rice	70002500	328		USEWS - Minnesota Valley NWR				dosed		Typically 35 acres of rice, reaches 160 acres in	_		Enderal	Coop - USFWS, Private		
50	ott	нюе	70002500	928	160	USHWS - Minnesota Valley NWK				ciosea		good years. Typically 20 acres of rice, reaches 120 acres once			+ eperal	Coop - Usi-ws, intrate		
	ott	Blue		316		USFWS - Minnesota Valley MWR				dosed		every 12-	c		Federal	USPWS		
	erburne erburne	Orrock Bice			162 187	USFWS - Sherburne NWR LISFWS - Sherburne NWR	good rice crop in 2009					Natural lake			Federal	USFWS - Sherburne NWR		
	erburne	Schoolhouse Pool			90	USFWS - Sherburne NWR	good rice trop in 2009						WLM VC	Type "C"	Federal	USFWS - Sherburne NWR		
Sh	erburne	Josephine Pool	71#AP008	143	72	USFWS - Sherburne NWR						Natural lake that was ditched	WUM VC	Type "C"	Federal	USFWS - Sherburne NWR		
	touis Louis	Knuckey Lapond	69080000 69017700	71 176			Take can be about one-half covered, some use by harvesters		fair		4100-4	1972 data (100%), now 5% rice						
31.	cours	capono				M1			1011		dinical	1972 data (100 A), now 3/4 nice						Throughout lake, typically open in the center. Surveyed
St.	. Louis	Big Rice	69066900 2	2,072 1,	700 64	MNDMR - WildEfe	Throughout lake, typically open in the center.	1854	good	high	essy	Outlet and pickerelweed control issues.	BDR FC		State	MNDNR-Wildlife		annually by 1854 Treaty Auth
	Louis .	Seven Beaver	69000200 1	1,508 1,	282 3	USES	Best rice is located in the narrows and south buy of lake, b		enod	low	difficul	Seeded by Forest Service in 1985. Possible old longing date.	BDR FC		Federal	USFS		Best rice is located in the narrows and south bey of lake, b
	Louis .	Crane	69061600 3	396	600 1	OF S	dest incers rocated at the nanoweard south day or asse, o		guida	low	ta nectar	regard nam.	BUT TO		reseran	ours.		
	. Louis	Vermilion River			562 66		7		good	high	easy							surveyed annually by 1854 Treaty Authority
56.	Louis	Big Rice	69017800	416	416	м			fair	high	difficul	1977 data, now 4 acres (1%).						No thick beds of rice this year with rice across most, also
	. Louis	Butterball			400 1		No thick beds of rice this year with rice across most of the		good	low	difficul		BDR		State	MNONR		called Long
St.	. touis	Birch	69000300 7	,628	381 5	Industrial - MN Power			good	low	essy		WLM VC		industrial	Industrial - MN Power		Can completely cover basis. Surveyed annually by 1854
St.	Louis	Little Rice	69051200	200	266 31	MNDNR - Wildlife	Can completely cover basin.		fair	hìgh	cesy		BDR C		State	MNDOT		Can comparely cover basin, surveyed annually by 1654 Treaty Auth
5t.	Louis	Hoodoo	69080200	252	252 3	M MNONE - Wildlife	Rice found over the entire lake at various densities from ra			low		1997 data Pike Bay: historically heavy rice, 250 acres, before	BDR					Rice found over the entire lake at various densities from ra
St.	. Louis	Vermillian			250	Dam?			poor		easy	structure, Rice Bay also	FC		State	MNDNR-Waters		
	. Lauis	Sturgeon			243	County						OCC program	BDR VC	WPA dam	County	County		
St.	. Łouis	Stone	69004600	230	173 54	MNDNR - WildEfe	?			moderate			BDR		State	State		surveyed annually by 1854 Treaty Authority Can completely cover basin in good years. Surveyed
St.	Louis	Breda			135 66	A.	Can completely cover basin in good years.	1854	good	hìigh	fair						Average it of stalks per 0.5 sq. meter is 61-80.	annually by 1854 Treaty Auth
	Louis	Bear	69011200 69073000		125			1854				1994 Survey data						
	touis touis	Sandy Pelican			121 119 16	MNDNR	historic good crops, (Twin Lakes)			moderate		1982 data. Used to manage but quit in 1992. Not managed currently	BDR C VC	WPA dam	State County	State County		
	Louis	Hay			114	MNDNR - Wildlife						The managed carrently						
	touis	Shannon	69092500	135	108 5								BDR		Federal	USFS		
	tous:	Leeman										man I	BDR		Federal			
				284			Best rice located at outlet of lake with some fringe rice on			low		1998 data 1997 data	BDR		Federal Federal	USFS		Best rice located at outlet of lake with some fringe rice on
	. Louis				90	Private, now public?				low		1997 data 1982 data: mining tailings over flow. Used to			Federal			Best rice located at outlet of lake with some fringe rice on
	t made	Little Sandy	69072900	89	90	Private, now public?	Best rice located at outlet of lake with some fringe rice on historic good crops, (Twin Lakes)	TOTA .		low		1997 data	BDR		Federal Federal Private	USFS Private		
	touis Louis	Little Sandy Stone Canosia WMA, Angell Pool	69072900 69003500	89 87	90			1854		low		1997 data 1982 data: mining tailings over flow. Used to manage, quit 1997 data. Seeded with 300 lbs in 1988		8PL	Federal Federal	USFS		Best rice located at cutlet of lake with some fringe rice on also called Tommila take
	. Louis	Stone Canosia WMA, Angell Pool	69072900 69003500 W0889001	89 87 500	90 89 85 80	Private, now public? M Twp MNDNR-Wildlife	historic good crops, {Twin Lakes}	1854		low		1997 data 1982 data: mining tailings over flow. Used to manager, quit 1997 data. Seeded with 300 lbs in 1988 Historically good rice but not since the 60's.	BDR C	BPL	Federal Federal Private Twp State	USFS Private Twp MNDIRE - Wildlife		
	Louis Louis	Stone Canosia WMA, Angell Pool Hay	69072900 69003500 W0889001 69043500	89 87 500 78	90 89 85 80 78	Private, now public? M Twp	historic good enops, (Twin Lakes) little rice in 2009: Barr Eng (PolyMet)	1854	2007		4000	1997 data 1982 data: mining tailings over flow. Used to manage, quit 1997 data. Seeded with 300 lbs in 1988 Historically good rice but not since the 60's. Coop: Covery	BDR	8FL	Federal Federal Private Twp State	USFS Private		
	. Louis	Stone Canosia WMA, Angell Pool	69072900 69003500 W0889001 69043500 69007000	89 87 500 78 353	90 89 85 80	Private, now public? M Twp MNDNR-Wildlife	historic good crops, {Twin Lakes}	1854	poor	low low	easy	1997 data 1982 data: mining tailings over flow. Used to manager, quit 1997 data. Seeded with 300 lbs in 1988 Historically good rice but not since the 60's.	BDR C	BFL	Federal Federal Private Twp State	USFS Private Twp MNDIRE - Wildlife		
St.	Louis Louis Louis Louis	Stone Canosia VIMA, Angell Pool Hay Low Hockey	69072900 69003500 W0889001 69043500 69007000 69084900	89 87 500 78 353 139	90 89 85 80 78 71 2 70 9	Private, now public? M Twp MNONR-Wildlife MNONR-Wildlife	historic good enops, (Twin Lakes) little rice in 2009: Barr Eng (PolyMet)	1854		low low		1997 data 1998 data: mining tallings over flow. Used to manages, quit 1997 data. Seeded with 300 lbs in 1988 Historically grood rise but not shoot the 60°s. Coop: County Data 1960's, currently 0%—baser problems Sxoelent bed of rise stilling good access to lake	BDR C BDR VC	BPL	Federal Federal Private Twp State Cooperative	USTS Private Twp MNDRR - Wildlife Coop - Country, DNR - WIL, FDL		
St.	Louis Louis Louis Louis Louis Louis	Stone Canosia WMA, Angell Pool Hay Low Hockey Moose	69072900 69003500 W0889001 69043500 6907000 69084900	89 87 500 78 353 139	90 89 85 80 78 71 2 70 9	Private, now public? M Twp MNDNR-Wildlife	historic good enops, (Twin Lakes) little rice in 2009: Barr Eng (PolyMet)	1854	fair	low	fair	1997 data. Mening tallings over flow. Used to manage, quit 1997 data. Seeded with 300 lbs in 1988 Historically good rice but not shore the 60°s. Coop: County Data 1960°s, currently 0% - basses problems	BDR C	BPL	Federal Federal Private Twp State Cooperative	LSFS Private Twp MNDRRWildlie Coop-County, DNRWL, FDL County		
St. St. St.	Louis Louis Louis Louis Louis Louis	Stone Canosia WMA, Angel Pool Hay Low Hockey Moose Turpela Bag	69072900 69003500 W0889001 69043500 6907000 69084900 69079800 69079800 69042700 69062100	89 87 500 78 353 139 82 76 71	90 89 85 80 78 71 2 70 9 62 36 61 53	Private, now public? M Twp MNONE - Wildlie MNONE - Wildlie MNONE - Wildlie MNONE - Wildlie	historic good enops, (Twin Lakes) little rice in 2009: Barr Eng (PolyMet)	1854	fair poor	low low	fair difficul	1997 data 1992 data mining talkings over flow. Used to manage, quidt 1997 data. Seeded with 300 lbs in 1988 Historically good rise but not since the 60's. Coopt County Data 1992's, coursely 0'fs - between problems Excellent bed of rice stilling good access to lake due.	BOR C BOR C	BFL	Federal Federal Private Twp State Cooperative	USTS Private Twp MNDRR - Wildlife Coop - Country, DNR - WIL, FDL		
St. St. St.	Louis Louis Louis Louis Louis	Stone Canosia WMA, Angell Pool Hay Low Moose Turpela	69072900 69003500 W0889001 69043500 6907000 69084900 69079800 69079800 69042700 69062100	89 87 500 78 353 139 82 76 71	90 89 85 80 78 71 2 70 9 62 36 61	Private, now public? Two MNDNR-Wildlife MNDNR-Wildlife MNDNR-Wildlife	historic good enops, (Twin Lakes) little rice in 2009: Barr Eng (PolyMet)	1854	fair	low low	fair	1997 data . 1992 data mining tallings over flow. Used to manage, quid . 1997 data. Second such 300 lbs in 1988 . Historically groot in the but not show the 60°s. Coopt. Coopt	BOR C BOR VC BOR C	BFL	Federal Federal Private Twp State Cooperative	LSFS Private Twp MNDRRWildlie Coop-County, DNRWL, FDL County		
St. St. St. St.	Louis Louis Louis Louis Louis Louis	Stone Canosia WMA, Angel Pool Hay Low Hockey Moose Turpela Bag	69072900 69003500 W0889001 69043500 69007000 69084900 6907900 6907300 69033100 6904000	89 87 500 78 353 139 82 76 71	90 89 85 85 80 78 71 2 70 9 62 36 61 53 51	Private, now public? M Twp MNONE - Wildlie MNONE - Wildlie MNONE - Wildlie MNONE - Wildlie	historic good enops, (Twin Lakes) little rice in 2009: Barr Eng (PolyMet)	1854	fair poor	low low	fair difficul	1997 data . Del28 data mining tallings over flow. Used to manage, quit . 1997 data . Seeded with 300 lbs in 1988 . Historically great rise but not show the 60°s. Coope County . Once 1967s, currently 60°s - between problems . Excellent bed of rise shilling good access to lake due to not . 1988 data . 1999 data. Managed by Deletts 1998 data . 1999 data. Managed by Deletts Sec seems not to be a labt on expand due to other .	BOR C BOR VC BOR C	BPL	Federal Federal Private Twp State Cooperative	LSFS Private Twp MNDRRWildlie Coop-County, DNRWL, FDL County		
St. St. St. St.	Louis	Stone Canoisia WMA, Angell Pool Hay Low Hockey Moose Turpella Bag Watuse Dollar	69072900 69003500 W0889001 69043500 6907000 69084900 69079800 69072700 69053100 69040800 69063400	89 87 500 78 353 139 82 76 71 64	90 89 85 80 78 71 2 770 9 62 36 61 51 51	Private, now public? M Twp MNONR - Wristlife	historie good cope, (Twin Lakes) little rive in 2009 Baar Cup (MelyMett) cody yapraner (in plants in 2002	1854	fair poor	low low	fair difficul	1997 data . 1992 data mining tallings over flow. Used to manage, quid . 1997 data. Second such 300 lbs in 1988 . Historically groot in the but not show the 60°s. Coopt. Coopt	BDR C BDR C BDR C BDR C	BFL	Federal Federal Private Twp State Cooperative	LSFS Private Twp MNDRRWildlie Coop-County, DNRWL, FDL County		elso callest Tomeills take
St. St. St. St.	Louis Louis Louis Louis Louis Louis Louis	Stone Canosis WMA, Angell Pool Hay Low Hockey Moose Turpels Bag Wabuse	69072900 69003500 W0889001 69043500 6907000 69084900 69079800 69072700 69053100 69040800 69063400	89 87 500 78 353 130 82 76 71 64	90 89 85 80 78 71 2 770 9 62 36 61 51 51	Private, now public? M Twp MNONR - Wristlife	historic good enops, (Twin Lakes) little rice in 2009: Barr Eng (PolyMet)	1854	fair poor	low low	fair difficul	1997 data mining taling over flow. Used to making, nail PDE data mining taling over flow. Used to making, nail PDE data. Seeded with 200 lbs in 1988 litters riskly good rise but one since the d'S. Copyr. Constr. USE, namedy GM-Leaver problems December 1997, namedy GM-Leaver problems ded due to one ded to one to the death of the construction of the district one of the desire of the desire one to be desired to the desired to	BDR C BDR C BDR C BDR C	8PL	Federal Federal Private Twp State Cooperative	LSFS Private Twp MNDRRWildlie Coop-County, DNRWL, FDL County	Wild rive density is modernet (1), and its condition was goo	
St. St. St. St. St. St.	Louis	Stone Canoisia WMA, Angell Pool Hay Low Hockey Moose Turpella Bag Watuse Dollar	69072900 69003500 W0889001 69043500 69047000 6904900 69042700 69053100 69042800 69063400 69041700	89 87 500 78 353 139 82 76 71 64	90 89 85 80 78 71 2 70 9 62 36 61 53 51 51 45	Private, now public? M Twp MNONR - Wristlife	historie good cope, (Twin Lakes) little rive in 2009 Baar Cup (MelyMett) cody yapraner (in plants in 2002	1854	fair poor	low low	fair difficul	1997 data . Del28 data mining tallings over flow. Used to manage, quit . 1997 data . Seeded with 300 lbs in 1988 . Historically great rise but not show the 60°s. Coope County . Once 1967s, currently 60°s - between problems . Excellent bed of rise shilling good access to lake due to not . 1988 data . 1999 data. Managed by Deletts 1998 data . 1999 data. Managed by Deletts Sec seems not to be a labt on expand due to other .	BDR C BDR C BDR C BDR C	BFL	Federal Federal Private Twp State Cooperative	LSFS Private Twp MNDRRWildlie Coop-County, DNRWL, FDL County	Wild rise density is modernes (O), and its condition was goo	elso callest Tomeills take
St.	Louis	Stone Canoda WMA, Angell Pool Hely Low Hockey Moose Turpella Bag Walbuse Dollar Hay Mod Bild Bild Bild Bild Bild Bild Bild Bil	69072500 69003500 W0889001 69007300 69007300 69007300 69027300 69027300 6905100 6905100 69041700 69041700 69075700 69075700	89 87 500 78 353 139 82 76 71 64 51 82 43 41	90 89 85 80 78 71 2 770 9 62 36 61 53 51 45 43 441	Private, now public? M Twp MNONR - Writing	historie good cope, (Twin Lakes) little rive in 2009 Baar Cup (MelyMett) cody yapraner (in plants in 2002	1854	fair poor fair	low low	fair difficul difficul	1997 data winning taling over flow. Used to measure, value of DEA data mining taling over flow. Used to measure, value of DEA data winning taling over the DEA data winning taling	BDR C	BPL	Federal Federal Private Twp State Cooperative County County	LB15 Private Thep MARCHE-Widdle Coop-County, DNR-WU, FBI County County	Wild rise density is made sets $\{I\}_{\alpha}$ and its condition was goo	elso callest Tomeills take
\$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t.	Louis	Stone Canosia WMA, Angel Pool Hay Low Hockey Moose Turpelia Big Walsure Dollar Hay Mud Rica Weshauk Namber One	69072400 69003500 W8889001 69043500 69043500 69064900 69042700 69042700 69042700 69063400 69063400 690637900 69079700 69079700 69079700 69079700	89 87 500 78 353 139 82 76 71 64 51 82 43 41 51	90 89 85 80 78 71 2 70 9 9 62 36 61 51 51 45 43 441 440	Private, now public? M Top MOUNE-Writine MOUNE-Writine MOUNE-Writine MOUNE-Writine MOUNE-Writine MOUNE-Writine MOUNE-Writine MOUNE-Writine MOUNE-Writine	historie good cope, (Twin Lakes) little rive in 2009 Bear Fug (Melyker) coty years fire plants in 2002 Bear said to on the east end of Take with the fire continual	1854	fair poor fair	low low moderate	fair difficul difficul	1997 Sate a William of Control (See See See See See See See See See Se	BDR C BDR C BDR C BDR C BDR C	BFL	Federal Federal Private Twp State Cooperative County County County	LASS Philade Page MARINE - Middle Coopt - County, DRIT - WL, TDL County County County County	Wild rier density is made see (1), and its condition we go	the called Tomolia take Beet stand is on the east end of laberwith the rise condituit
\$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t.	Louis	Stone Canoda WMA, Angell Pool Hely Low Hockey Moose Turpella Bag Walbuse Dollar Hay Mod Bild Bild Bild Bild Bild Bild Bild Bil	69072200 69003500 W8888001 69043500 69047000 69064000 69072700 69051100 69041700 69041700 69041700 69041700 69051700 69057700 69057700 69057700 69057700	89 87 500 78 353 139 82 76 71 64 51 82 43 41 51 3800	90 89 65 80 78 71 2 70 9 62 36 61 53 51 51 45 45 44 44 40 17	Private, now public? M Tup MADDR - Wildlie	historie good cope, (Twin Lakes) little rive in 2009 Bear Fug (Melyker) coty years fire plants in 2002 Bear said to on the east end of Take with the fire continual		fair poor fair poor fair	low low moderate	fair difficul difficul difficul difficul	1997 data winning taling over flow. Used to measure, with 2002 data mining taling over flow. Used to measure, with 2002 data winning taling over the district of the district one	BDR C	BFL	Federal Federal Private Twp State Cooperative County County County	LASS Philade Page MARINE - Middle Coopt - County, DRIT - WL, TDL County County County County	. While the density is moderate (1), and to condition was goo	the called Tomolia take Beet stand is on the east end of laberwith the rise condituit
\$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t.	Louis	Stone Granoia WMA, Angell Pool Hay Low Hischay Moose Tarpala Waltstee Dollar Hay Mad Mark Market One Ralley Wolf	69073200 6903500 W0889001 59043000 69064900 69064900 6905420 6905420 6	89 87 500 78 353 139 82 76 71 64 51 82 43 41 51	90 89 85 80 78 71 2 70 9 9 62 36 61 51 51 45 43 441 440	Private, now public? M Tup MADDR - Wildlie	historie good cope, (Twin Lakes) little rive in 2009 Bear Fug (Melyker) coty years fire plants in 2002 Bear said to on the east end of Take with the fire continual	1854 1854	fair poor fair poor fair fair	low moderate	feir difficul difficul difficul difficul difficul easy	1997 Sate Seed of the Seed of the Used to measure, 14th Seed of seed of 200 bit is 1988 State of Seed of seed of 200 bit is 1988 Seed of seed of 200 bit is 1984 Seed of seed of 200 bit is 1984 Seed of seed of 200 bit is 1984 Seed of 200 bit i	BDR C	вм.	Federal Federal Private Twp State Cooperative County County County	LASS Philade Page MARINE - Middle Coopt - County, DRIT - WL, TDL County County County County	Wild rise density is neadered (3), and its condition was goo	the called Tomolia take Beet stand is on the east end of laberwith the rise condituit
\$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t.	Louis	Stone Comoia WMA, Angell Pool Hey Low Hockey Moose Truspial Beg Walste Low More Walste	69072900 6901300 6901300 6901300 6901300 69031000 6907900 69042700 69053400 69042700 69053400 69042700 6907900	89 87 500 78 353 139 82 76 71 64 51 82 43 41 51 3,800 456	90 89 85 80 78 771 2 770 9 62 36 61 53 51 51 45 44 44 40 17 17 17	Private, now public? M Tup MADDR - Wildlie	historie good cope, (Tudis Lakes) little nin in 2009 Baar Fug (Melyker) only years for plants in 2002 that stand is on the east and of Tuke with the first continual Good rice led across lake skild downstream. Installation, Narway Py, Matorick in strikury	1854	fair poor fair poor fair	low low moderate	feir difficul difficul difficul difficul	1997 Sate Seed of the Seed of the Used to measure, 14th Seed of seed of 200 bit is 1988 State of Seed of seed of 200 bit is 1988 Seed of seed of 200 bit is 1984 Seed of seed of 200 bit is 1984 Seed of seed of 200 bit is 1984 Seed of 200 bit i	BDR C	BFL	Federal Federal Private Twp State Cooperative County County County	LASS Philade Page MARINE - Middle Coopt - County, DRIT - WL, TDL County County County	While incidently is moderate (H), and its condition was goo	the called Tomolia take Beet stand is on the east end of laberwith the rise condituit
\$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t.	Louis	Stone Comoisi MMA, Angell Pool Hay Lov Holiza Lov Holiza Moose Turpris Bee Widnise Hay Mod Rice Rice Rice Rice Rich Rich Rich Rich Rich Rich Rich Rich	69072900 6903500 W0085001 6903500 6907300 6907700 6907700 6907700 69087000	89 87 500 78 353 139 82 76 71 64 51 82 43 41 51 3,800 456	90 89 85 80 87 78 78 77 2 70 9 9 62 36 61 55 51 55 45 44 44 44 46 17 17 17 14	Private, now public? M Tup MADDR - Wildlie	historie good cope, (fain takes) little nie in 2009 Bearting (fruhjsket) ookly go are rice planto in 2002 floor at and is on the east and of false with the rice continual Good rice led across take sind downstream. Insulanteer, Nerway Pr, historic in entury Insulanteer, Nerway Pr, historic in entury	1854 1854	fair poor fair poor fair fair	low moderate	feir difficul difficul difficul difficul difficul easy	1997 Sate Seed of the Seed of the Used to measure, 14th Seed of seed of 200 bit is 1988 State of Seed of seed of 200 bit is 1988 Seed of seed of 200 bit is 1984 Seed of seed of 200 bit is 1984 Seed of seed of 200 bit is 1984 Seed of 200 bit i	BDR C	BPL.	Federal Federal Private Twp State Cooperative County County County	LASS Philade Page MARINE - Middle Coopt - County, DRIT - WL, TDL County County County	Wild rise density is made sets $\Omega_{\rm L}$ and its condition was goo	the called Tomolia take Beet stand is on the east end of laberwith the rise condituit
\$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t. \$t.	Louis	Stone Comoia WMA, Angell Pool Hey Low Hockey Moose Truspial Beg Walste Low More Walste	69072900 6903300 W06B9001 69073000 69077000 69077000 69077000 69072000 69042000 690541000 690541000 690541000 690541000 690541000 690541000 690541000 690541000 690570000 69057000 69057000 69057000 69057000 69057000 69057000 690570000 69057000 69057000 69057000 69057000 69057000 69057000 6905700000 6905700000000000000000000000000000000000	89 87 500 78 353 139 82 76 71 64 51 82 43 41 51 3,800 456	90 89 85 80 87 78 78 77 2 70 9 9 62 36 61 55 51 55 45 44 44 44 46 17 17 17 14	Private, now public? M Tup MADDR - Wildlie	historie good cope, (Tudis Lakes) little nin in 2009 Baar Fug (Melyker) only years for plants in 2002 that stand is on the east and of Tuke with the first continual Good rice led across lake skild downstream. Installation, Narway Py, Matorick in strikury	1854 1854	fair poor fair poor fair fair	low moderate	feir difficul difficul difficul difficul difficul easy	1997 Sate Seed of the Seed of the Used to measure, 14th Seed of seed of 200 bit is 1988 State of Seed of seed of 200 bit is 1988 Seed of seed of 200 bit is 1984 Seed of seed of 200 bit is 1984 Seed of seed of 200 bit is 1984 Seed of 200 bit i	BDR C	894.	Federal Federal Private Twp State Cooperative County County County	LASS Philade Page MARINE - Middle Coopt - County, DRIT - WL, TDL County County County	Wild ries density is modernes (1), and its condition was goo	the called Tomolia take Beet stand is on the east end of laberwith the rise condituit

CHRIST	Safet Hard	State MC	Sight Street	ar street	per sast per "	and the state of t	HERET DE	Sect of	STATE THE PARTY.	September 1	Wat Wall	get en Sale berger	Self	Career Liver	wid pic.	58-per per per per per per per per per per
it. Louis	Little Indian Sloux River					66N, 15W - good stands along banks, used by harvesters										
St. Couis	Papoose	69002400				can have thick rice over entire lake, some use by harvesters										
St. Couis	Petrel Creek					56N, 12W - thick rice in areas, used by harvesters into Breda I.										
it. Louis	Sand River					60N, 16W- can contain good stands										
it. Louis	Washusk #2					55N, 15W - rice along shore, sparse in center										
St. Louis	Partridge River					58N, 14-15W - number of stands with good density										
St. Louis	Rice					64N, 19W - can have thick rice over entire lake (2007, 2008)										
										Wild rice was planted by the Belgrade						
Steams	Tamarack	73027800	470	235		island clumps throughout				Sporstmen's Club in 19			State	MNONR - Wildlife		island dumps throughout
										Water influenced by Turtle Creek watershed.						
Fodd	Long	77006900	356	338	1 M MNDNR-Wildlife	Typically thickest in north portion of lake, more spotty in	fair	low	easy	take adjacent to	BDR	NatDut	Cooperative	Private, State		Typically thickest in north portion of lake, more spotty in
										Water influenced by Turtle Creek watershed.						
Fodd	Mud	77008700	398	318	M MNONR - Wildlife	Rice typically around shoreline, can cover almost all of ope	fair	low	fair	Lake within Turt	BDR		Private	Private		Rice typically around shoreline, can cover almost all of ope
										County ditch outlet on west side. Access thru						
Todd	Twin	77002100	317	159	M				feir	Ostendorf Stat			Cooperative	Private, Public		
										Affected by county ditch, flows into Long Lake,						
Todd	Ragers	77007300	185	130	1 M	Typically in a wide band around shoreline.		low	difficul	outlet has c		c	Private	Private		Typically in a wide band around shoreline.
Todd	Nelson	77000500	84	70	M	Entire lake.			difficul	Private access.					Wild rice density is lush (4) to rank (5), and its condition	Entire lake.
										Problems with water from Turtle Creek						Most of rice on south end where connected to Thursder
Todd	Rice	77006100	675	60	M	Most of rice on south end where connected to Thunder Lake.	fair	low	difficul	watershed.			Cooperative	Private, Public		Lake.
Wabasha.	Zumbro River					Zumbro Bottoms, McCarthy Lake- acreage, wildlife value										
Wadena	Yanger	80002200	384	346	M MNDNR - Wildlife	Entire lake, best stands are located on west side & across t	fair	moderate			BDR	VC	State	MNDNR - Wildlife		Entire lake, best stands are located on west side & across t
Wadena	Burgen	80001800	92	86	MNDNR - Wildlife	Covers 93% of water area.	poor	low	difficul				Private	Private		Covers 93% of water area.
Wadena	Strike	80001300	76	76		1988: sparce rice. 1963 100% covered.	fair	low	difficul							1988: sparce rice, 1963 100% covered.
Wadena	Round	80001900	58	58	A MNDNR-WIMIN/DU		fair	moderate	fair	1993	BDR					
Wadena	Granning	80001200	50	50		Entire lake.		low	fair	1988 Sparcerice. 1963: 50 acres of rice (100%)						Entire lake.
Wadena	Blueberry	80003400		30.0		historic wild rice camp										
Waseca	Everson	81002700				cattail/phrag.Fringe and open water. Varies in size and density year to year.				Stand was only about 10 acres in 2009						
Waseca	tilly	81006700			nse stand around perimeter of the basin											
Wright	Sandy	86022400	118			Fortire lake				Within SuconivState WMA					In 2004, wild rice density was moderate (3) and in fair (2)	Entire lake

Appendix E

Details of Wild Rice Surveys on Swan Lake Southwest Bay and Swan River

Swan Lake 19-Aug-10

Plot 50 5236778 N 484220 E	Stems 20		Plot 19	Stems	Height		Stems	Height		Stems	Height	Grid	Stem Number
5236778 N	20		Diot 10				Otema			Ottina			
		Ω/		45		Plot 91	14		Plot 81	7		Grid 6	45 8
484220 E			5236749 N			5236609 N			5236485 N		82		8
		86	484086 E		100	484183 E		82	484174 E		71		49
		105			118			87			73		23
		110			93			71			66		20
													8
Plot 29	22	156	Plot 14	8	65	Plot 41	10	51	Plot 82	1	100		8 39 17
5236780 N		120	5236749 N		51	5236609 N		58	5236485 N				17
484219 E		56	484081 E		55	484178 E		48	484175 E				25
		129			125			38					14
		113			39			47					32
													18
													15
Plot 39	34	85	Plot 50	49	96	Plot 52	0	0	Plot 71	15	84		3
5236779 N		135	5236746 N		111	5236610 N			5236486 N		82		3 50
484219 E		126	484087 E		82	484179 E			484174 E		63		21
		113			97						112		30
		128			107						103		6
													79
Plot 59	0	0	Plot 49	23	72	Plot 11	0	0	Plot 51	6	93		30 6 79 35
5236776 N			5236746 N		100	5236609 N			5236488 N		85	Grid 7	20
484219 E			484086 E		122	484175 E			484174 E		79		22
					67						69		34
					98						48		0
													12
Plot 69	12	128	Plot 79	20	77	Plot 4	0	0	Plot 22	13	100		35
5236775 N	-		5236743 N			5236612 N	_		5236491 N		103		26
484219 E			484086 E			484174 E			484175 E		65		26
		124			108						98		15
		130			99						57		52
													27
													26
Plot 57	35	112	Plot 90	8	91	Plot 33	0	0	Plot 11	7	65		0
5236776 N			5236742 N			5236611 N			5236492 N	,	80		1 1
484217 E			484087 E			484177 E			484174 E		74		15
		109			95				· · · · · · -		61		61
		124			71						28		69
					· · ·								39
													39

	Grid 7			Grid 6			Grid 8			Grid 9			ke Stem Statistics
	Stems	Height	Grid	Stem Number									
Plot 97	26	104	Plot 99	39	99	Plot 43	3	80	Plot 3	11	93		30
5236772 N		115	5236741 N		116	5236611 N		50	5236493 N		98	Grid 8	14
484217 E		102	484086 E		131	484178 E		22	484176 E		48		10
		75			128						43		(
		130			93						49		(
Plot 46	8	161	Plot 77	17	58	Plot 64	14	66	Plot 53	4	59		(
5236778 N			5236743 N			5236612 N			5236488 N		83		3
484216 E			484084 E			484180 E			484176 E		107		14
404210 L		78			97	404100 L		56			70		1-
		114			107			53			7.0		19
		114			107			55					19
													25
Plot 26	15	40	Plot 48	25	77	Plot 74	6	10	Plot 54	9	95		23
5236780 N	10		5236746 N	25		5236612 N	0		5236488 N	9	96		15
484216 E			484085 E			484181 E			484177 E		96		15
404210 E		109			85	404101 E		73			114		1
		109			104			50			58		17
		100			104			50			58		
Plot 25	52	74	Plot 35	14	400	DI LOA	19	0.4	Plot 95	00	122		14
	52			14		Plot 84	19			23			(
5236780 N			5236747 N			5236612 N			5236484 N		79		1
484215 E			484082 E			484182 E			484178 E		81	Grid 9	
		115			115			58			97		
		118			100			71			100		15
													13
Plot 35	27	93	Plot 45	32	98	Plot 85	19	64	Plot 76	20	91		7
5236779 N			5236746 N			5236613 N			5236486 N		86		11
484215 E			484082 E			484182 E			484179 E		98		4
		128			112			58			121		9
		126			94			71			115		23
													20
													18
Plot 55	26	135	Plot 75	18	109	Plot 76	25	83	Plot 55	18	128		19
5236776 N	1 20		5236743 N	"		5236614 N			5236488 N	10	71		(
484215 E			484082 E			484181 E			484178 E		98		
		142			98			96			93		,
		94			105			92			70		
		34			100			32			70		2
Plot 74	0	n	Plot 86	15	100	Plot 46	23	112	Plot 35	19	91		- 6

	Grid 7			Grid 6			Grid 8			Grid 9		Total Lake Stem Statistics		
	Stems	Height	Grid	Stem Number										
5236774 N			5236742 N			5236614 N			5236490 N		123			
484214 E			484083 E			484178 E			484178 E		88			
					90			62			97			
					70			44			89			
21 1 22			D	ļ .		DI + 00	4.5		DI 1 05			1		
Plot 62	1	/5	Plot 94	3		Plot 26	15		Plot 25	0	C	4		
5236775 N			5236741 N			5236614 N			5236491 N			4		
484212 E			484081 E		34	484176 E			484178 E			1		
								59				4		
								45				1		
Plot 61	15	138	Plot 73	50	118	Plot 57	7	59	Plot 77	7	76	 		
5236775 N			5236743 N			5236615 N		82	5236486 N		91	1		
484211 E		102	484080 E		90	484179 E		109	484180 E		83			
		109			119			38			45			
		125			87			58			75			
Plot 51	61	167	Plot 32	21	107	Plot 87	0	0	Plot 87	0	C			
5236776 N	01		5236747 N	21		5236615 N	- 0	0	5236485 N	_		4		
484211 E			484079 E			484182 E			484180 E			1		
404211 L		126			90				404100 L			1		
		92			124							1		
		02			124							1		
Plot 31	69	124	Plot 41	30	113	Plot 25	17	77	Plot 97	0	C	1		
5236779 N			5236746 N			5236613 N			5236484 N	_	_			
484211 E			484078 E			484176 E			484180 E			1		
		123			118			82				1		
		134			121			66				1		
]		
			Plot 72	6								1		
Plot 33	39		5236743 N			Plot 10	14		Plot 60	4				
5236779 N			484079 E			5236618 N			5236488 N		124			
484213 E		96				484174 E			484183 E		52			
		138			99			48			46	<u> </u>		
		148						54				1		
			Plot 81	79								1		
Plot 12	32		5236742 N			Plot 50	0	0	Plot 30	4				
5236781 N			484078 E			5236618 N			5236491 N		73			
484212 E		98	1		123	484178 E			484183 E		72	2		

Grid 7			Grid 6			Grid 8			Grid 9			Total Lake Stem Statistics		
	Stems	Height	Grid	Stem Number										
		120			109						39			
		76										1		
			Plot 92	35	133							1		
Plot 1	30	145	5236741 N		114	Plot 60	1	45	Plot 20	6	94	1		
5236782 N		113	484079 E		137	5236618 N			5236492 N		62	1		
484211 E		134			140	484179 E			484183 E		68	1		
		120			115						90	1		
		143									59	1		

	Stems	Height		Stems	Height		Stems	Height		Stems	Height		Stems
Total	524	10086	Total	537	9892	Total	18	4365	Total	174	6420	Total	1422
Mean	26.2	114.61	Mean	26.85	100.94	Mean	9.3	62.36	Mean	8.7	79.26	Mean	17.775
Median	26	120	Median	22	100	Median	8.9	65	Median	7	82	Median	15
S.D.	19.07	29.15	S.D.	18.66682	24.01	S.D.	8.6	3 27.17	S.D.	7.12	26.53	S.D.	16.70668403

Appendix F

Photographs of Swan Lake Southwest Bay and Swan River



Figure F-1 Swan Lake Southwest Bay, View of Eastern Shore, July 18, 2010



Figure F-2 Swan Lake Southwest Bay, View of Eastern Shore, July 18, 2010



Figure F-3 Swan Lake Northwest Grid Location, July 18, 2010



Figure F-4 Swan Lake Southwest Bay, Grids Located in Lake's Center, July 18, 2010